ROY O. WEST
JUL 22 1959
LIBRARY

Agricultural Economics RESEARCH

CONTENTS FOR APRIL–JULY 1959 *Vol. XI, Nos. 2 and 3*

Page

The January 1959 Revision of the Price Indexes.....*B. R. Stauber, R. F. Hale, and B. S. Peterson* 33

A New Technique for Estimating Forest-Land Areas By Ownership Class..... *R. O. McMahon* 81

Book Reviews.....*Rupert B. Vance, Lois Bacon, Bushrod W. Allin, and Marc Nerlove* 89

UNITED STATES DEPARTMENT OF AGRICULTURE • Agricultural Marketing Service
Agricultural Research Service

Contributors

B. R. STAUBER, Chief of the Agricultural Price Statistics Branch of AMS, is responsible for directing the program for collecting data on prices received by farmers for commodities sold and prices paid for commodities and services bought, together with general responsibility for the Index of Prices Received and the Parity Index, and for computation of Parity Prices. He is Chairman of the Mathematics and Statistics Committee of the Graduate School of the U.S. Department of Agriculture. ROGER F. HALE, in charge of the Prices Paid Section of the Agricultural Price Statistics Branch of AMS, is directly responsible for the detailed supervision of the program for the collection of data on prices paid by farmers for goods and services, and the computation of the Parity Index. BYRON S. PETERSON, in charge of the Prices Received Section of the Agricultural Price Statistics Branch of AMS, is similarly responsible for supervision of the program for collection of data on prices received by farmers and for the computation of the Index of Prices Received by Farmers and of Parity Prices.

R. O. McMAHON is a forest economist with the Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Portland, Oreg.

RUPERT B. VANCE is Research Professor, Department of Sociology, University of North Carolina, specializing in demography. He is a former president of the American Sociological Society and also of the Population Association of America.

LOIS BACON is Deputy Director of the Foreign Agricultural Analysis Division, FAS. She was formerly with the European Analysis Branch, where her work included research on agriculture in the United Kingdom.

BUSHROD W. ALLIN is Chairman of the Outlook and Situation Board, which is responsible for the technical review and approval of all economic outlook and situation reports prepared within the U.S. Department of Agriculture.

MARC NERLOVE, formerly with the Statistical and Historical Research Branch, AMS, is author of the recent book, *The Dynamics of Supply; Estimation of Farmers' Response to Price*. He is Associate Professor of Economics and Agricultural Economics, University of Minnesota.

This publication is a consolidation of the regular April and June issues. Beginning in October, publication will be resumed on the usual quarterly basis.

EDITORS: Charles E. Rogers
James P. Cavin
ASSISTANT EDITORS: Kenneth L. Bachman
Winn Finner

AGRICULTURAL ECONOMICS RESEARCH

A Journal of Economic and Statistical Research in the
United States Department of Agricultural and Cooperating Agencies

Volume XI APRIL–JULY 1959 Numbers 2 and 3

The January 1959 Revision of the Price Indexes

By B. R. Stauber, R. F. Hale, and B. S. Peterson

The following article describes the January 1959 revision of the price indexes relating to prices received and prices paid by farmers. These indexes are the basic measures of the general price relations affecting American farmers. They are also used in computing parity prices of farm products as required for the administration of various national programs.

According to law, the reference period for these indexes for program purposes is the 5-year period 1910–14, which means that the indexes must measure price change over the span of nearly a half century—a period that has been marked by some of the most rapid changes in technology, marketing organization, and production methods in all history. This places a heavy load upon the indexes.

It has been the policy to make revisions in the indexes—to revise weights and to review commodity coverage—from time to time. The indexes were first published in the 1920's, revised in 1933–34, and again in 1950. The current revision, however, is the first for which specific information was available from a nationwide farm expenditure survey having for one of its two main purposes the updating of the weighting pattern for the Parity Index. Accordingly, not only does the current revision benefit from the best technical basis for weights that we have ever had; it also provides a Parity Index with a weighting pattern that is more nearly current than at any other time in nearly a quarter of a century.

The authors wish to acknowledge their indebtedness and express their deep appreciation to O. V. Wells, Administrator of the Agricultural Marketing Service, and to Nathan Koffsky, Chief of the Farm Income Branch, and C. Kyle Randall, Head of the Statistical and Historical Services Section of AMS, for their advice and counsel at all stages of the work of revising these indexes. These, together with the senior author, served as an informal committee to review and approve all major steps in the work of the revision.

The actual computations were conducted under the direction of B. R. Stauber, Chief, Agricultural Price Statistics Branch, AMS, with Byron Peterson in charge of the work for the Index of Prices Received, and Roger Hale for Prices Paid. The assistance of Rudolph Wagner, George Ferrell, W. A. Hill, Charles Hines, Christian Stokstad, Florence Moore, Ronald Johnson, and Floyd Rolf, and also of a devoted and competent secretarial and clerical staff, is gratefully acknowledged.

Certain phases of this revision were the subject of hearings before the Subcommittee for Agriculture of the Committee on Appropriations, House of Representatives, February 4, 1959 (86th Cong., 1st sess.). As a result, considerable detailed information is presented in the published report of these hearings (7).[1]

[1] Numbers in parentheses refer to Literature Cited, p. 80.

IN JANUARY 1959 the Agricultural Marketing Service revised the Index of Prices Received by Farmers and the Index of Prices Paid by Farmers Including Interest, Taxes, and Wage Rates. This revision consisted primarily of updating the weighting pattern of the indexes; it preserved the general structure and organization of the indexes as revised in January 1950 and described in this journal for April of that year. It is significant that the authors of the 1950 article (p. 49) quoted a technical subcommittee of the Bureau Committee on Index Numbers to the effect that "it is strongly recommended that investigations be planned now to secure data which can be used as a basis for weights for the Index of Prices Paid for a suitable postwar period. The 1937–41 period is almost a decade behind. It is essential that the weight base period does not lag too far behind the current calculation of the index."

The 1951 budget of the U.S. Department of Agriculture requested funds for making the surveys necessary to obtain basic expenditure data for a contemporary period from which to determine new weights for the Parity Index, but budgetary exigencies were such that it was not until fiscal year 1956 that funds became available.

The current revision, therefore, accomplishes an updating of weights in these indexes which has been long recognized as overdue, and for the first time in a quarter of a century, provides a current index of prices paid by farmers which is reasonably up to date in its weighting pattern.

Historical

There is already available a reasonably adequate and fairly detailed historical review of the development of both the prices received and prices paid indexes (*6*, *16*). It will therefore suffice to say here that the Index of Prices Received by Farmers had its genesis in a set of computations based on prices of 10 crops which were published in the March 1909 issue of the *Crop Reporter*, and in an index published in the succeeding monthly issues and in those of its successor, the *Monthly Crop Report* (*2*). Prices of livestock were brought in somewhat later, and in 1921 the Department published "Prices of Farm Products in the United States" (*17*). A new series of index numbers was published by the former Bureau of Agricultural Economics in 1924, and this was revised in 1934, in 1944, in January 1950, and in January 1954 (*13*, *15*, *6*, *8*). Each revision has been made for the purpose of achieving more complete and adequate commodity coverage, more up-to-date or representative commodity weights, or improvement in handling various technical problems of price measurement.

It was recognized very early that an analysis of the economic position of farmers could not be accomplished without information concerning the purchasing power of the products they had to sell. Consequently, in 1928 the Bureau of Agricultural Economics published the first Index of Prices Paid by Farmers (*10*), using price data collected by the Bureau since 1910. Weights for each price series were determined from farm cost-of-living investigations and farm management surveys conducted by various agencies within the Department for representative areas in different parts of the country during the period 1920 to 1925. In a few instances, surveys for earlier periods were used, and where no data were available, estimates based on total production and sales statistics were employed. With the passage of the Agricultural Adjustment Act of 1933 the index acquired legal status in that it was used thereafter for the computation of parity prices. The initial index was revised in 1933 (*11*, *12*, *14*), at which time weights based on information mainly for 1924–29 were used for combining the various commodities. Interest and taxes were added in August 1935 in response to amendments (approved Aug. 24, 1935) to the Agricultural Act of 1933 (*16*).

A further revision was undertaken in 1936 but, though a preliminary report was published in May 1939, the revision was never adopted. The 1950 revision was the most thoroughgoing in nearly 20 years, and drew upon the cumulative experience available from previous efforts.

It also achieved the broadest commodity coverage of any revision up to that time. Expansion in coverage had been made from time to time as new data became available. Thus for 1910, only 142 price series were available but the number had been expanded to 181 as of 1927. The greatest single addition was as of 1935, for which it was possible to expand the coverage to 335

items (*6*). (This includes about 35 items that were included in more than one subgroup.) Since that time, some further additions and substitutions have been made on the basis of information available from a variety of sources concerning farmers' buying practices.

No general attack on the problem of securing improved representativeness was possible, however, until the 1955 Farm Expenditure Survey and the 1955 Food Consumption Survey became available. At that time, looking forward to the projected index revision, steps were initiated to modify the price collection program of the Agricultural Marketing Service to coincide with the findings of the survey, and to expand coverage to the extent that resources were available.

General Structure of Indexes Retained

The 1959 revised indexes are of the same general form as those of the 1950 revision. The weighting pattern continues to represent the average of all farms. The same major and minor commodity groups and subgroups indexes are retained. The commodity content of the various groups has been reviewed, however, and where appropriate, revised in line with currently available price series and expenditure or sale patterns as the case may be. The revision necessarily added a new link to the pattern established by the 1950 revision. Thus, the 1950 revision uses weights for the period 1924–29 from 1910 to 1935, with allowance for motor vehicles and supplies introduced in 1924, and weights representing the period 1937–41 from 1935 forward. The 1959 revision continues this principle, using weights for the period 1955 (1953–57 for the prices received index) from September 1952 forward, and linked to the previous indexes in September 1952.

The Index of Prices Paid for Commodities and Services Including Interest, Taxes, and Farm Wage Rates—the Parity Index

Basis for Weights for 1959 Revision

The primary basis for the weighting pattern of the 1959 revision of this index was provided by the Farm Expenditure Survey, conducted in the spring of 1956 jointly by AMS and the Bureau of the Census, with the cooperation of the Agricultural Research Service of the U.S. Department of Agriculture (*18*, *19*).

These data were supplemented by a survey of food consumption made in early 1955 by ARS and AMS (*9*). In addition, various sources of official information of the Department were used. Particularly important were data from the ARS for interest on farm real estate indebtedness, taxes on farm real estate, annual estimates of fertilizer consumption; and information on livestock from the official estimates of the Department.

The dimensions of the Farm Expenditure Survey and of the Food Consumption Survey have been set forth in some detail in other publications (*18*, *19*, *9*). Briefly, the sample for the survey was a stratified probability sample designed to give unbiased estimates of farmers' expenditures for both living and production. The number of usable questionnaires was 6,715 for production expenditures and 3,845 for family living expenditures. Schedules for both questionnaires were obtained by special enumerators in 306 primary sampling units (counties or pseudocounties) throughout the United States (fig. 1) and the results expanded to U.S. totals on a basis representing all farms. The Food Expenditure Survey was a detailed enumerative nationwide survey of food consumption among city, rural, and rural nonfarm families. Like the Farm Expenditure Survey, it was conducted on a probability sample design. The rural farm segment of the food survey was based on reports from 2,006 cooperating families, and this segment was used for the index revision.

Collectively, these sources undoubtedly represent the most satisfactory set of basic source data ever available for use in developing weights for the Parity Index.

The new group weights, based on data for 1955, are presented in table 1, together with those of previous periods for comparison. The actual expenditures for each major group and subgroup have, of course, increased sharply from 1937–41 to 1955, but the increases have not been uniform from group to group so that the distribution of expenditures as between major index groups has changed. In 1955, a larger proportion of total expenditures was used for items used in production, with a corresponding smaller proportion spent for items used for family living, and for interest, taxes, and wages for hired farm labor.

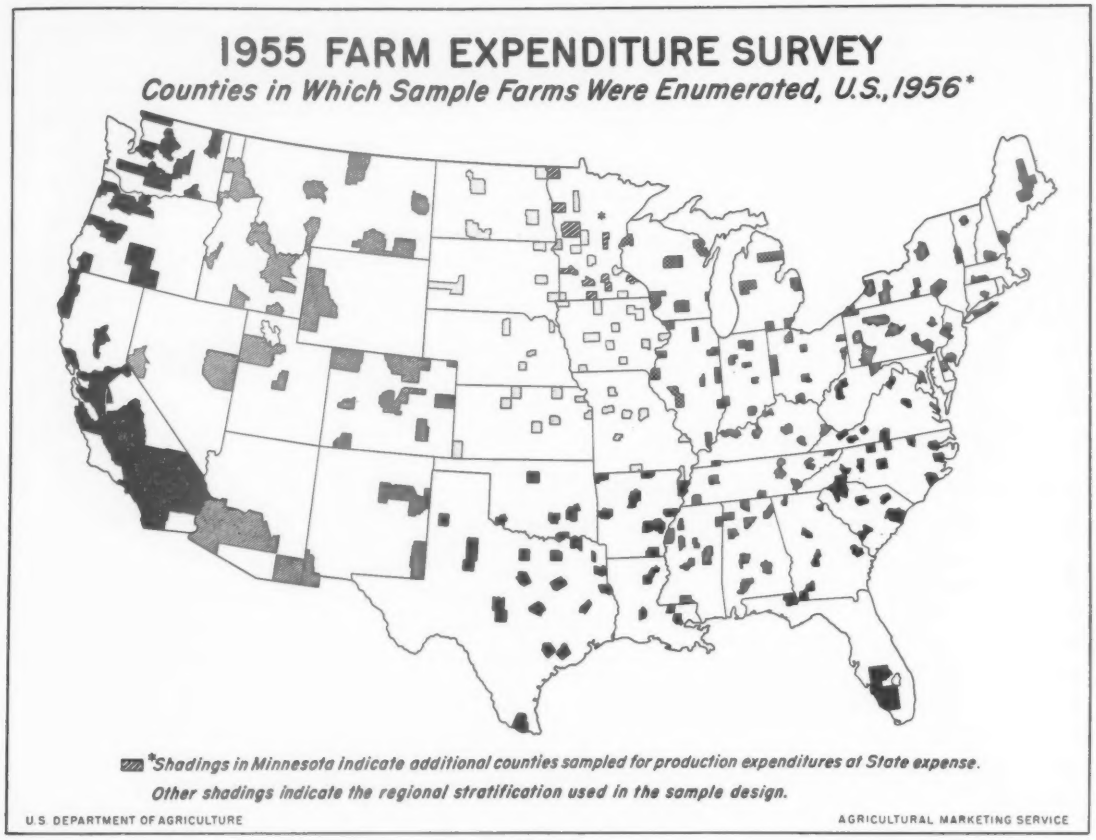
1955 FARM EXPENDITURE SURVEY
Counties in Which Sample Farms Were Enumerated, U.S., 1956*
*Shadings in Minnesota indicate additional counties sampled for production expenditures at State expense.
Other shadings indicate the regional stratification used in the sample design.
U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FIGURE 1

The above shift in expenditure distribution appears to be quite consistent with the reduction in the number of farms, the increasing tendency toward production on larger farms, and the increasing commercialization of agriculture generally.

Development of Group Weights

From the results of the above mentioned survey, including numerous detailed tabulations in work sheet form from the Expenditure Survey, expenditures for almost 2,500 items for which farmers reported expenditures were assigned to the several index categories.

Family living groups.—For family living expenditures, the commodity groups are food and tobacco, clothing, autos and auto supplies, household operation, household furnishings, and building materials for house. For certain types of expenditures, price series are not now available and never have been. Because of this lack, it continues to be impossible to include such items in the index computations, and thus to measure their effect directly. Thus, of family living expenditures, price series are not now and never have been available to measure price trends for the various elements entering into the cost of medical care to farm families amounting to $1,044 million or 7.4 percent of all expenditures for living purposes; recreation, $328 million or 2.1 percent; cash gifts and contributions, $523 million or 2.1 percent; and personal insurance, $409 million or 2.6 percent of expenditures for living purposes.

These groups have never been represented in the index and it is impossible with resources now available to undertake the collection of the price data necessary to incorporate them in the index. But their importance has been spread over the available six index subgroups so that their effect is reflected in the distribution of weights between the major component indexes.

TABLE 1.—*Group weights: Index of prices paid by farmers, including interest, taxes, and wage rates*

Item	Weight base period		
	1924–29 [1]	1937–41 [2]	1955 [3]
	Percent	*Percent*	*Percent*
Living	41. 2	44. 0	39. 50
Food (including tobacco [4])	14. 8	16. 7	13. 40
Clothing	12. 5	8. 6	6. 34
Autos and auto supplies	4. 5	6. 9	5. 63
Household operations	3. 9	5. 9	5. 77
Household furnishings	2. 4	4. 0	3. 99
Building materials, house	3. 1	1. 9	4. 37
Production	36. 4	41. 2	50. 90
Feed	10. 1	10. 2	12. 80
Livestock	4. 4	5. 3	4. 60
Motor supplies	3. 9	5. 2	8. 39
Motor vehicles	3. 9	5. 2	4. 38
Farm machinery	3. 4	4. 5	5. 21
Building and fencing materials	3. 7	2. 7	5. 20
Fertilizer and lime	2. 7	3. 1	4. 11
Equipment and supplies	3. 3	3. 3	3. 66
Seeds	1. 0	1. 7	2. 55
Total commodities	77. 6	85. 2	90. 40
Taxes	5. 7	3. 8	2. 04
Interest	6. 5	3. 0	. 96
Cash wage rates	10. 2	8. 0	6. 60
Commodities, interest, taxes, and cash wage rates	100. 0	100. 0	100. 0

[1] 1910 to March 1935.
[2] March 1935 to September 1952, inclusive.
[3] September 1952 forward.
[4] June 1935 forward.

Some reduction in the list of unallocated expenditures was accomplished by the introduction of a series of tuition fees for land-grant colleges into the household operation index. This series together with the series measuring average newspaper subscription rates used to represent changes in the per unit cost of nontechnical reading matter, is considered as part of the general cost of household operation, which includes such general items as fuel, laundry supplies, and electricity, telephone, and other services of benefit to individuals within the family group, as well as to the group as a whole.

Production groups.—For production, the commodity groups are feed, feeder and stocker livestock, motor supplies, motor vehicles, farm machinery, building and fencing materials, fertilizer and lime, farm supplies, and seed. As in the case of living commodities, there are certain production items for which it has not been possible with available resources to initiate the collection of price data. These categories include machine hire and custom work in the amount of $567 million or 2.8 percent of all production expenditures. They include $509 million of marketing expenses for crop and livestock or 2.5 percent, cash rent and irrigation to the amount of $514 million or 2.6 percent, and insurance of $155 million. These, together with various miscellaneous items, amount in all to about 15 percent of total production expenditures.

Price series for these are not now available, and never have been, for with available resources it has not been possible to include such items in the AMS price collection program. Since their effect could not be imputed uniquely to any specific price series or index group it was imputed to the production group as a whole and allocated on a pro rata basis in determining the percentage weights.

Existing group indexes, for the most part, measure price changes for fairly homogeneous categories of items. In some cases, however, some question could arise as to which group an item should be assigned, as for example whether a particular item should be considered as farm machinery or as an item in the farm supply group.

In general, all mobile equipment for field and transport (excluding tractors, trucks, and autos) were classified as farm machinery. Likewise, stationary engines, motors, hammer mills, elevators, and bulk milk coolers, all with moving parts, were assigned to the machinery index. Small tools, including both hand and shop tools were placed in the farm supply category, along with spray materials, crop containers, and other general farm supplies. In some cases, however, where prices paid data were not available for items like water heaters, sinks, and other milkhouse equipment, weights were assigned to prices of milk coolers or other farm machinery items in the farm supply index, and the series with the appropriate weight carried in the farm supply index until a specific price series can be established.

General imputation problems.—This classification of expenditures into index categories provided the basis for the percentage weights used for combining the various groups and subgroup indexes into the total index.

As indicated in a later section, the use of percentage weights for combining the subgroups of living into the combined Living Index; for combining the subgroups of production into the combined Production Index, and for combining these with the indexes for Interest on Farm Mortgage Indebtedness, Taxes on Farm Real Estate, and Farm Wages into the total Parity Index is equivalent, under the conditions and procedures used herein, to a direct computation from the several aggregates—prices multiplied by quantities—as expressed in the conventional form of index number representation.

Table 2 presents a summary of this phase of the analysis. The first column shows total expenditures imputed to individual commodities in each index category. The next column indicates the expenditures for items imputed specifically to each group, but not to any individual item. The third column is the sum of columns 1 and 2. The fourth column shows the preceeding column inflated to take account of the distribution of the various expenditures which properly belong in the living and production groups (such items as medical, dental, and hospital expense, personal insurance, custom work, and marketing expenses, as already indicated) but which do not fit an existing index category and for which no price series are available. These have to be considered in the overall weight, vis-a-vis other components, even though no specific price series are available for their measurement.

A special adjustment is required in the case of food and tobacco expenditures. The Food Consumption Survey provided the detail on farm food purchases, by individual items, for one week in the spring of 1955. This, plus expenditures for tobacco, was the basis for the entries in the first three columns of the table. For food items, they represent 52 times the value of a week's consumption of purchased food. This is based on food purchases in the spring of the year, a season when some home-produced food is available for use.

The data for food and tobacco in column 4, on the other hand, are based on the Farm Expenditure Survey data for the entire year. Prior to the general imputation of their proportionate share of noncovered family living items, they were $49 higher than indicated by the Food Consumption Survey. Being based on the enumeration of four seasonal subtotals, the higher expenditure for the year indicated by the Farm Expenditure Survey was accepted, in view of seasonal differences in amounts purchased, sampling, and other discrepancies between the two surveys.

With respect to the Feeder and Replacement Livestock allocation, since the estimates of receipts from sale of livestock used in computing income from livestock sales—and the weights for the livestock component of the Prices Received Index—do not include as sales the income received from sales to other farmers in the same State, it was concluded that the Livestock Group in the Prices Paid Index should be on the same basis. Accordingly, the expenditure data exclude intrastate purchases and are on a basis comparable to the income data and AMS official estimates. These estimates, rather than the survey data, were used for determining the group weight for livestock.

Similarly, since information for the expenditure survey was collected for the most part from farm operators (some of whom operated rented land), rather than from landlords, it was decided to use the existing ARS series to represent expenditures for interest on mortgages secured by farm real estate and for taxes payable on farm real estate. This insured the inclusion of payments by both operators and landlords, and conformed to the legislative language in determining what shall be included in the index.

The new expenditure pattern is of course on a much higher level than heretofore. In 1955, farmers were spending more for every major expenditure category. But the increases were far from uniform—the distribution of expenditures has shifted considerably. The major shift, as indicated by table 1, was toward a larger proportion of expenditures in the Production categories collectively, and smaller proportions for Living, Taxes on Farm Real Estate, Interest on Farm Mortgage Indebtedness, and for Cash Wages. As indicated by the table, some readjustments also occurred within groups. Thus, although the proportion of expenditures for living purposes collectively declined, the proportions for building materials for the farm home increased. Similarly, there was variation in the Production group, most categories of which were up, though proportionate expenditures for motor vehicles and livestock were down.

TABLE 2.—*Farm expenditures: Dollars per farm, United States, 1955* [1]

Expenditure group	Imputed to individual items	Imputed to individual groups	Total imputed to groups	Total expenditure	
				Actual	Relative
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Percent*
Living total	2, 201. 48	419. 50	[2] 2, 620. 98	[3] 3, 283	39. 50
Food and tobacco	764. 40	87. 36	[4] 851. 76	[5] 1, 113	13. 40
Clothing	355. 39	72. 02	427. 41	527	6. 34
Household furnishings	254. 88	14. 70	269. 58	332	3. 99
Household operations	297. 36	90. 12	387. 48	480	5. 77
Building material, house	177. 91	98. 05	[6] 275. 96	[7] 363	4. 37
Auto and auto supplies	351. 54	57. 25	[8] 408. 79	468	5. 63
Production total	3, 072. 64	546. 12	3, 618. 76	[9] 4, 237	50. 90
Feed	801. 73	106. 90	[10] 908. 63	1, 064	12. 80
Livestock	327. 00	----------	[11] 327. 00	383	4. 60
Motor supplies	487. 59	109. 57	[8] 597. 16	699	8. 39
Motor vehicles	311. 75	----------	[8] 311. 75	365	4. 38
Farm machinery	261. 31	109. 33	370. 64	434	5. 21
Building and fencing materials	220. 70	148. 82	369. 52	433	5. 20
Fertilizer and lime	291. 52	----------	291. 52	342	4. 11
Farm supplies	228. 84	32. 22	261. 06	305	3. 66
Seed	142. 20	39. 28	181. 48	212	2. 55
Total living and production	5, 274. 12	965. 62	6, 239. 74	7, 520	90. 40
Interest	----------	----------	----------	[12] 80	. 96
Taxes	----------	----------	----------	[12] 171	2. 04
Total commodities, interest, and taxes	----------	----------	----------	7, 771	93. 40
Wage rates	----------	----------	----------	548	6. 60
Grand total	----------	----------	----------	8, 319	100. 00

AGRICULTURAL MARKETING SERVICE

[1] Basis Farm Expenditure Survey for 1955, the Household Food Consumption Survey, and related estimates of the Agricultural Marketing Service and the Agricultural Research Service. Relative expenditures (percent) for Living; Production; Living and Production combined; and Living, Production, Interest, and Taxes all rounded to 3 significant digits.

[2] Excludes expenditures of $594 per farm family for medical expenses; haircuts, beauty shop and other personal services; movie and other admissions; other recreational expenses; personal insurance; gifts and contributions; and other miscellaneous expenses which were distributed proportionately to each living expenditure group; also $35 equalization adjustment basis supplementary survey indications, namely a $49 deficiency in the Household Food Consumption Survey, a $17 expenditure for lodging away from home, and a $31 increase in the family living portion of auto expense based on combined returns from both the living and production component of the Farm Expenditure Survey.

[3] 101.015 percent of $3,250 (2621+594+49+17−31) placing expenditures per family on a per farm basis.

[4] Allocations based on independent and detailed data from Household Food Consumption Survey for 1 week in the spring of 1955.

[5] Based on Farm Expenditure Survey; includes expenditures for food away from home.

[6] Excludes expense of vacation housing, lodging at school, etc., interest and taxes on owner-occupied dwellings.

[7] Excludes taxes ($39) and mortgage interest ($20) on owner-occupied dwellings.

[8] Estimate based on indications from farm production and family living surveys.

[9] 117.084 percent of $3,618.76 to include allowance for expenditures for machine hire and custom work, veterinary services, insurance, marketing costs other than feed fed at markets, etc.; subgroup totals are increased proportionally.

[10] Includes cost of feed fed at markets.

[11] Based on purchases of feeder and stocker livestock and poultry excluding interfarm sales within States, as estimated by Agricultural Economics Division, Agricultural Marketing Service.

[12] Based on estimates of the Agricultural Research Service.

Determination of Commodity Quantity Weights

Within each index group, the quantity weights were derived from the expenditures reported by the surveys and other basic sources (or estimated from source data where expenditures were not explicitly given) for each index item, together with direct imputations for similar items purchased, but for which price series are not available.

The surveys reported expenditures for many more items purchased by farmers than it has been possible for the AMS to include in the current price collection program. It was therefore necessary to match the expenditure items as reported by the surveys to the available price series, to assign expenditure weights from the surveys to the

available price series, and to impute to the extent possible to commodities for which price series were available, the expenditure for items that were similar in character but for which price series were not available. For example, a price series is available for prices paid by farmers for white granulated sugar, but not for powdered or brown sugar. Since these items all have a similar origin, the expenditures for powdered and brown sugar were added to that for white granulated sugar to reflect purchases of all sugar.

Similarly, a price series is available for white bread, but not for whole wheat and other bread or for rolls, biscuits, cakes, pies, and kindred wheat products. As these are all derived from flour and other generally similar ingredients, the expenditures for all are imputed to the price series for white bread.

A considerable number of the items reported in the surveys were either represented directly by price series or imputed to items sufficiently alike to provide reasonably accurate indications of price trends. In most index groups, however, a residuum of items could not be imputed to any available price series, although they definitely could be assigned to the specific index group.

Moreover, there were in most index groups many items for which the expenditure was trivial. On the basis of comparisons made during the 1950 revision (*6*) the general rule was adopted to include an available price series if the item amounted to as much as one-half of 1 percent of the expenditure for the group, but to drop the series and discontinue price collection if the item accounted for less than one-half of 1 percent of the group total. Thus, the resources available for collecting current price data are directed to pricing commodities that are important in farmer expenditures.

Table 3 presents the working table for the food and tobacco group and illustrates the general pattern of imputation followed. Specifically, the qualifying items in the food group for which price series are available for 1955 are listed on the left side of the table, and the expenditures for those and similar food items on the other. Items are arranged so as to coincide as nearly as possible with the items for which prices were available.

Items that match precisely are shown in opposite columns in the same line of the table. Items which match approximately and whose weight was imputed to the series for which prices are available are shown immediately following. This listing includes rice and lemons, items dropped because the amount spent for them was no longer as much as one-half percent of the total. Where no price series is available, and where no available series is sufficiently similar to justify "imputation," the weight is shown as "unallocated." The totals from this table are also those shown in columns one to three inclusive of table 1 under Food and Tobacco. Other groups are handled in a generally similar manner.

It will be noted that the data from the survey are in terms of expenditures for the items in question. These were used in arriving at a total expenditure, including imputations for the respective items. The actual quantity weight (table 4) was then derived by dividing the expenditure items by the average price for the commodity priced in the year 1955. This then became the basic quantity weight by which the prices year by year were multiplied to compute the commodity aggregates.[2]

The pattern just described was followed generally, although some modifications were made as special circumstances required.

Some modification of this specific approach was required in determining weights for building materials for house and for service buildings. In this case the expenditure survey did not report in detail the quantities of individual items of lumber, cement, and other building materials bought by farmers. It was impracticable for farmers to report this type of item in detail, especially on contracted construction. But the survey did indicate the farms on which new dwellings had been erected by the farm operator during the year in question. A photograph of each of these dwellings was taken, together with fairly detailed information concerning the general outline and dimensions of the structure, the materials used in its construction, and similar information.

[2] Basic quantity weights are changed when pricing specifications are revised; when one commodity price series is substituted for another, or when a portion of the weight is assigned to a new item as new price series become available. These shifts are not confined to the base period or the period covered by the revision. For example, 16 percent of the weight for ground or bean coffee was assigned to a new price series for instant coffee in March 1958.

TABLE 3.—*Food and tobacco prices paid by farmers: Revision of index coverage and weights, United States, based on expenditures for purchased food and tobacco used at home, spring of 1955*

Commodity coverage	Expenditures for index items including imputations		Imputations	
	Per week	Annual	Item	Weekly [1] expenditures
	Dollars	*Dollars*		*Dollars*
Grand total	16. 38	851. 76		
Total allocated	14. 70	764. 40		
Food	13. 70	712. 40		
Tobacco	1. 00	52. 00		
Unallocated	1. 68	87. 36		
Sweets	. 92	47. 84		
Sugar, white granulated	. 52	27. 04	Sugar, all	0. 52
			White	. 49
			Granulated	. 45
			Powdered	. 04
			Brown	. 03
Table sirup	. 21	10. 92	Sirup	. 09
			Corn, cane	. 06
			Maple, sorgo	. 03
			Molasses	. 02
			Honey	. 01
			Jellies	. 04
			Jam	. 05
Candy, nonchocolate	. 19	9. 88	Candy	. 19
			With nuts	. 06
			No nuts	. 13
Cereal and bakery products	3. 02	157. 04		
Bread, white	1. 19	61. 88	Bread	. 79
			White	. 70
			Whole wheat	. 06
			Other	. 03
			Rolls	. 05
			Ready-to-eat	. 03
			Brown and serve	. 02
			Biscuits	. 01
			Cakes	. 10
			Pies	. 02
			Doughnuts, etc	. 22
Soda crackers	. 14	7. 28	Crackers	. 14
			Sweet	. 03
			Soda	. 11
Flour, white	. 90	46. 80	Flour	. 65
			White	. 64
			Other	. 01
			Flour mixes	. 15
			Pancake	. 02
			Cake	. 10
			Biscuit	. 02
			Other	. 01
			Prepared (Jello) puddings	. 10
Baking powder	. 18	9. 36	Leaveners	. 07
			Yeast	. 02
			Other	. 05
			Seasoning	. 11
			Salt	. 04
			Other	. 07
Cornmeal	. 15	7. 80	Meal	. 13
			Grits	. 02
Oatmeal	. 09	4. 68	Hot cereals	. 09
			Oatmeal	. 06
			Wheatena	. 03
Macaroni	. 15	7. 80	Macaroni	. 08
			Rice	. 07

See footnote at end of table.

509573—59——2

TABLE 3.—*Food and tobacco prices paid by farmers: Revision of index coverage and weights, United States, based on expenditures for purchased food and tobacco used at home, spring of 1955*—Continued

Commodity coverage	Expenditures for index items including imputations		Imputations	
	Per week	Annual	Item	Weekly [1] expenditures
	Dollars	*Dollars*		*Dollars*
Cornflakes	.22	11.44	Ready-to-eat Cereals	.22
			Cornflakes	.09
			Wheat flakes	.08
			Rice flakes	.02
			Other	.03
Meat, fish	3.34	173.68		
Steak, round	.79	41.08	Steak	.30
			Round	.17
			Other	.13
			Roast	.22
			Rib	.04
			Other	.18
			Stew meat	.07
			Chip beef	.04
			Canned beef	.01
			Meat soups	.05
			Other mixtures	.10
Hamburger	.37	19.24	Hamburger	.28
			Liver	.09
Bacon, sliced	.48	24.96	Smoked bacon	.37
			Salt pork	.07
			Other smoked pork	.04
Ham, whole	.31	16.12	Smoked ham	.27
			Fresh ham	.02
			Canned pork	.02
Pork chops	.19	9.88	Pork chops	.16
			Pork loin	.03
Pork sausage	.18	9.36	Fresh sausage	.12
			Other fresh pork	.06
Frankfurters	.25	13.00	None	
Bologna	.41	21.32	Other luncheon meat	.41
			Canned	.02
			Other	.39
Canned salmon	.36	18.72	Canned fish	.16
			Salmon	.10
			Tuna	.05
			Other	.01
			Frozen fish	.15
			Shellfish	.05
Unallocated	.31	16.12	Poultry	.31
Dairy products and eggs	2.28	118.56		
Butter	.38	19.76	None	
Cheese, American	.39	20.28	American cheese	.30
			Processed	.18
			Nonprocessed	.12
			Swiss cheese	.01
			Cream cheese	.02
			Cottage cheese	.03
			Other cheese	.01
			Cheese spreads	.02
Evaporated milk	.70	36.40	Evaporated milk	.11
			Condensed milk	.01
			Dry milk	.04
			Skim	.03
			Other	.01
			Ice cream	.54
Whole milk	.60	31.20	Whole milk	.51
			Buttermilk	.03
			Cream	.03
			Skim, chocolate, etc	.03
Eggs	.21	10.92	None	

See footnote at end of table.

TABLE 3.—*Food and tobacco prices paid by farmers: Revision of index coverage and weights, United States, based on expenditures for purchased food and tobacco used at home, spring of 1955*—Continued

Commodity coverage	Expenditures for index items including imputations		Imputations	
	Per week	Annual	Item	Weekly [1] expenditures
	Dollars	*Dollars*		*Dollars*
Vegetables	1. 57	81. 64		
Potatoes, Irish	. 45	23. 40	Irish potatoes	. 37
			Sweetpotatoes	. 01
			Canned potatoes	. 01
			Potato chips	. 06
Navy beans	. 16	8. 32	Dry beans	. 11
			Lima	. 03
			Navy, etc	. 08
			Dried peas	. 01
			Baked beans	. 04
Cabbage, fresh	. 20	10. 40	Cabbage	. 07
			Asparagus	. 01
			Cucumbers	. 03
			Onions	. 04
			Dry	. 03
			Green	. 01
			Sweet corn	. 01
			Snap beans	. 02
			Other vegetables	. 02
Lettuce	. 26	13. 52	Lettuce	. 11
			Dark green leafy vegetables	. 01
			Carrots	. 05
			Peppers	. 01
			Celery	. 06
			Other vegetables	. 02
Tomatoes, fresh	. 11	5. 72	Fresh tomatoes	. 11
Unallocated	. 22	11. 44	Tomato juice	. 02
			Tomato, soup, etc	. 04
			Tomato catsup	. 08
			Pickles, etc	. 08
Canned corn	. 19	9. 88	Canned corn	. 08
			Canned asparagus	. 01
			Canned lima beans	. 01
			Canned snap beans	. 05
			Canned tomatoes	. 04
Canned peas	. 20	10. 40	Canned peas	. 08
			Canned beets	. 01
			Other canned vegetables	. 05
			Baby food, vegetable	. 01
			Frozen peas	. 02
			Frozen limas	. 01
			Frozen broccoli	. 01
			Other frozen vegetables	. 01
Fruit	. 86	44. 72		
Apples, fresh	. 12	6. 24	Fresh apples	. 12
Unallocated	. 46	23. 92	Melons	. 05
			Fresh strawberries	. 07
			Other fresh berries	. 01
			Fresh cherries	. 01
			Fresh peaches	. 03
			Frozen fruit	. 02
			Canned apples	. 02
			Canned apricots	. 01
			Canned berries	. 01
			Canned cherries	. 02
			Canned peaches	. 05
			Canned pears	. 02
			Fruit cocktail	. 03
			Other canned fruit	. 01
			Baby food, fruit	. 02
			Deciduous fruit juices	. 04
			Vinegar	. 04

See footnote at end of table.

TABLE 3.—*Food and tobacco prices paid by farmers: Revision of index coverage and weights, United States, based on expenditures for purchased food and tobacco used at home, spring of 1955*—Continued

Commodity coverage	Expenditures for index items including imputations		Imputations	
	Per week	Annual	Item	Weekly [1] expenditures
Fruit—Continued	*Dollars*	*Dollars*		*Dollars*
Bananas	.24	12.48	Bananas	.24
Unallocated	.07	3.64	Avocados	.01
			Dried fruit	.06
			Prunes	.02
			Raisins	.02
			Others	.02
Oranges	.50	26.00	Oranges	.18
			Grapefruit	.07
			Lemons	.06
			Canned pineapple	.05
			Canned citrus	.08
			Frozen concentrate	.06
Fats and oils	.77	40.04		
Lard	.17	8.84	None	
Vegetable shortening	.13	6.76	None	
Salad dressing	.20	10.40	Salad dressing	.16
			Mayonnaise	.09
			French	.01
			Other	.06
			Salad oil	.04
Peanut butter	.13	6.76	Peanut butter	.09
			Shelled nuts	.04
			Peanuts	.02
			Other	.02
Oleomargarine	.14	7.28	None	
Beverages	.94	48.88		
Coffee	.81	42.12	Bean and ground	.68
			Instant coffee	.11
			Coffee substitute	.02
Unallocated	.27	14.04	Alcoholic beverages	.27
			Beer	.16
			Wine	.01
			Whisky, etc	.10
Tea	.13	6.76	Tea	.13
Unallocated	.35	18.20	Chocolate, etc	.07
			Chocolate	.02
			Cocoa	.04
			Sirup	.01
			Soft drinks	.28
			Bottled, canned	.25
			Colas	.17
			Fruit pop	.04
			Other	.04
			Powdered	.02
			Frozen ades	.01
Tobacco	1.00	52.00		
Cigarettes	.80	41.60	Cigarettes	.75
			Cigars	.05
Smoking tobacco	.20	10.40	Smoking tobacco	.09
			Chewing, snuff	.10
			Pipes	.01

[1] By rural farm families: From Household Food Consumption Survey 1955, Report No. 1.

Typical of the supplementary details enumerated for these houses were the type of foundation; the existence of a basement and its dimensions; the materials used in constructing floors, walls, and partitions; type of heating, fuel, water, and sewage system installed; separate sketches of the layout for the first and second floors, with existing porches; type of above-ground construction and exterior covering; type of sheathing and insulation materials; type of finish of interior walls and ceilings; the linear feet of partitions; and the flooring material used.

TABLE 4.—*Food and tobacco prices paid by farmers: Derivation of revised commodity index weights, basis food consumption and farm expenditure surveys for 1955, United States*

Item	Annual [1] expenditures per household, 1955	Average price paid, 1955	Average amount bought [1]		Distribution of 1955 expenditures		
					Actual	Basis current index	
			Quantity	Unit		Price × 1937–41 wt.	Relative
	Dollars	*Dollars*	*Number*		*Percent*	*Dollars*	*Percent*
Sweets	47. 84				6. 2	36. 58	7. 0
Sugar	27. 04	1. 04	26. 0	10 lb.	3. 5	20. 49	3. 9
Sirup	10. 92	. 161	67. 8	Lb.	1. 4	13. 04	2. 5
Candy	9. 88	. 328	30. 1	Lb.	1. 3	3. 05	. 6
Cereal and bakery products	157. 04				20. 5	130. 44	24. 8
Bread	61. 88	. 173	358. 0	Lb.	8. 1	35. 81	6. 8
Crackers	7. 28	. 272	26. 8	Lb.	1. 0	5. 63	1. 1
Flour	46. 80	2. 14	21. 9	25 lb.	6. 1	50. 17	9. 5
Baking powder	9. 36	. 228	41. 1	Lb.	1. 2	7. 37	1. 4
Cornmeal	7. 80	. 074	105. 0	Lb.	1. 0	12. 74	2. 4
Oatmeal	4. 68	. 142	33. 0	Lb.	. 6	5. 63	1. 1
Macaroni	7. 80	. 227	34. 4	Lb.	1. 0	2. 64	. 5
Cornflakes	11. 44	. 291	39. 3	Lb.	1. 5	[2] 10. 45	2. 0
Meat and fish	173. 68				22. 7	107. 54	20. 4
Round steak	41. 08	. 776	59. 6	Lb.	5. 4	35. 02	6. 6
Hamburger	19. 24	. 412	53. 0	Lb.	2. 5	8. 60	1. 6
Bacon, sliced	24. 96	. 552	54. 6	Lb.	3. 3	[3] 12. 59	2. 4
Ham	16. 12	. 613	30. 5	Lb.	2. 1	6. 31	1. 2
Pork chops	9. 88	. 669	15. 5	Lb.	1. 3	6. 82	1. 3
Sausage	9. 36	. 490	19. 1	Lb.	1. 2	3. 96	. 8
Frankfurters	13. 00	. 492	26. 4	Lb.	1. 7		
Bologna	21. 32	. 488	43. 7	Lb.	2. 8	13. 08	2. 5
Salmon	18. 72	. 569	32. 9	Lb.	2. 4	21. 16	4. 0
Dairy products and eggs	118. 56				15. 6	45. 12	8. 6
Butter	19. 76	. 708	27. 9	Lb.	2. 6	18. 84	3. 6
Cheese	20. 28	. 562	36. 1	Lb.	2. 7	11. 90	2. 3
Evaporated milk	36. 40	. 160	228. 0	Lb.	4. 8	3. 81	. 7
Whole milk	31. 20	. 227	137. 0	Qt.	4. 1	7. 84	1. 5
Eggs	10. 92	. 558	19. 6	Doz.	1. 4	2. 73	. 5
Vegetables	81. 64				10. 8	52. 70	10. 0
Potatoes	23. 40	. 501	46. 7	10 lb.	3. 1	15. 06	2. 8
Beans, Navy	8. 32	. 170	48. 9	Lb.	1. 1	7. 79	1. 5
Cabbage	10. 40	. 071	146. 0	Lb.	1. 4	5. 14	1. 0
Lettuce	13. 52	. 196	69. 0	Head	1. 8	5. 32	1. 0
Tomatoes	5. 72	. 250	22. 9	Lb.	. 7	8. 29	1. 6
Corn, canned	9. 88	. 162	61. 0	Lb.	1. 3	7. 23	1. 4
Peas, canned	10. 40	. 177	58. 8	Lb.	1. 4	3. 87	. 7
Fruit	44. 72				5. 8	54. 66	10. 4
Apples	6. 24	. 153	40. 8	Lb	. 8	28. 20	5. 4
Bananas	12. 48	. 174	71. 7	Lb	1. 6	9. 07	1. 7
Oranges	26. 00	. 480	54. 2	Doz	3. 4	[4] 17. 39	3. 3
Fats and oils	40. 04				5. 2	20. 96	4. 1
Lard	8. 84	. 199	44. 4	Lb	1. 2	9. 20	1. 8
Vegetable shortening	6. 76	. 321	21. 1	Lb	. 8	2. 47	. 5
Salad dressing	10. 40	. 324	32. 1	Lb	1. 4	3. 79	. 7
Peanut butter	6. 76	. 470	14. 4	Lb	. 8	4. 10	. 8
Margarine	7. 28	. 287	25. 6	Lb	1. 0	1. 40	. 3
Beverages	48. 88				6. 4	53. 87	10. 2
Coffee	42. 12	. 924	45. 6	Lb	5. 5	48. 97	9. 3
Tea	6. 76	1. 53	44. 2	Lb.	. 9	4. 90	. 9
Tobacco	52. 00				6. 8	23. 46	4. 5
Cigarettes	41. 00	. 227	183. 0	20	5. 4	9. 92	1. 9
Smoking tobacco	10. 40	1. 17	8. 89	Lb.	1. 4	13. 54	2. 6
Total	764. 40				100. 0	525. 33	100. 0

[1] Including imputations.
[2] Including wheat flakes and rice.
[3] Including salt pork.
[4] Including lemons and grapefruit.

In addition, the number of doors and windows on the first and second floors were counted, by types; the linear feet of base and wall cabinets in the kitchen were measured, and the number of fireplaces noted. Similar detail was recorded for the roof, including the type of material used; the number and material used in constructing chimneys, and the number of dormers. Other notations covered how much of the exterior and interior was painted and whether the house was equipped with screens and storm windows.

This information was then utilized by an engineer familiar with building construction to develop the bill of goods necessary to construct a building of the type and size indicated. This was done for all of the farm dwellings for which sample data were available. From this analysis a representative bill of goods was developed, and this was combined with other survey data to develop the pattern of total expenditures for building purposes. Appropriate weights were derived from this analysis.

Commodity Coverage Compared With Previous Revisions

The commodity coverage achieved in the 1959 revision sets a new high in the history of the index both qualitatively and quantitively. Information available from the 1955 surveys in many respects provided more satisfactory data than had been available for any earlier revision, and the commodity review, in addition to being far more current than in previous revisions, was considerably more precise for many items.

As a consequence of this revision there was a net increase of 49 in the index coverage—from 340 to 389. This is net in terms of individual commodity price series. Some of these series, however, appear in more than one commodity group. Thus gasoline, autos, telephones, electricity, to mention only a few, are used for both family living and production purposes. Accordingly, these price series enter into an appropriate subgroup within both the family living and farm production categories, with the weights allocated appropriately. Including such duplications, the total number of index items has increased from 370 to 435, or a total increase of 65.[3]

[3] Not all commodities could be added in 1952, as several new series did not begin till after that date, and several did not begin until 1958.

As a result of changes in purchasing patterns, 62 commodities were so unimportant as not to merit continuing in the index, based on the one-half-percent criterion. Nine others were dropped, but replaced by other essentially similar items. For example, the average price for *all soybean meal*, was replaced by *soybean meal* with 44 percent protein; similarly, the average price for *all cottonseed meal* was replaced by *cottonseed meal* with 41 percent protein.

The most important single addition to the commodity coverage was used autos and pickup trucks. According to the Expenditure Survey, these items accounted for about a third of the expenditures by farmers for all autos and trucks. The weight for these items was divided between living and production on the basis of the usage indicated by the survey. This addition was made, not in 1952, but at the beginning of 1955, inasmuch as war and immediate postwar conditions—including the Korean conflict—had brought about an unusually strong sellers' market for used cars. To have introduced this group of items in 1952, would have had a distorting influence.

This situation had about worked itself out by 1955, so that the trend in used car prices since 1955 has generally paralleled that of new cars and trucks. This introduction has not strongly affected the index since 1955, but it has broadened the commodity base, and gives a more dependable measure of this area of expenditures than continued reliance wholly on new car and truck prices. Of the added items, only 16 represented substitution items, and 120 were outright additions—items shown to be important in farmers' 1955 purchases for which price series are available. These included such items as cake mix, nylon slips, postage rates, television sets, bathtubs, and turkey feed.

Table 5 presents a complete list of items dropped, added, and substituted, with the average 1955 expenditure per farm and the one-half percent criterion for each group. There are only a few exceptions to the general rule of one-half percent. Parcel post expenditures at $1.83 per year fell slightly below the one-half percent point of expenditures for household operation; yet parcel post rates do not necessarily change at the same time or by the same amount as first-class mail rates.

TABLE 5.—*The parity index: Items added and dropped, January 1959 revision*

Item	1955 average expenditure per farm	Added new	Substituted for—	Dropped
	Dollars			
Food and tobacco:				
Chuck roast	11.44	X		
Frying chicken	16.12	X		
Frankfurters	13.00	X		
Frozen haddock	10.40	X		
Ice cream	28.08	X		
Cake mix	7.80	X		
Catsup	7.28	X		
Canned peaches	11.96	X		
Canned pineapple	6.76	X		
Instant coffee	6.76	X		
Cola drinks	14.56	X		
Beer	14.04	X		
Rice	3.64			X
Lemons	3.12			X
Total	851.76	12		2
½ percent of total	4.26			
Clothing:				
Women's nylon slips	9.87	X		
Men's:				
Leather jackets	1.51			X
Rubber overshoes, without buckles	.74			X
Women's:				
Coats, wool, heavy, with fur trim	.98			X
Straw hats, work	1.34			X
Hose, cotton	.43			X
Yard goods, percale	1.90			X
Total	427.41	1		6
½ percent of total	2.14			
Household operation:				
Fuel oil	29.44	X		
Magazines	5.72	X		
College tuition	19.31	X		
Postage:				
Letter mail	5.55	X		
Parcel post	1.83	X		
Total	387.48	5		
½ percent of total	1.94			
Household furnishings:				
Sheets, 81 by 108 inches	2.93	X		
Toweling, part linen	1.45		Cotton toweling	
Dinette sets	4.19	X		
Refrigerators:				
8 cu. ft	2.28		9 cu. ft	
10 cu. ft	3.47		do	
11 cu. ft	6.56		do	
Home freezers:				
12 cu. ft	5.88	X		
14 cu. ft	3.86	X		
16 cu. ft	4.18	X		
18 cu. ft	7.44	X		
Electric toasters	3.29	X		
Television sets:				
17-in. screen	8.07	X		
21-in. screen	36.21	X		
Muslin	.45			X
Mattress, all felted	.86			X
Bedsprings, sagless	1.21			X
Water glasses	.46			X
Radio-phonographs	.74			X
Total	269.58	9	4 for 2	5
½ percent of total	1.35			

See footnotes at end of table.

TABLE 5.—*The parity index: Items added and dropped, January 1959 revision*—Continued

Item	1955 average expenditure per farm	Added new	Substituted for—	Dropped
	Dollars			
Building materials, house:				
T and G roofers	1.73	X		
Oak flooring:				
Select	3.52	X		
No. 1	3.44	X		
Asbestos shingles	1.61	X		
Plywood interior, ¼ in. AD	3.22	X		
Brick, face	1.57	X		
Paint, interior	8.21	X		
Kitchen cabinet	7.17	X		
Electric cable	5.23	X		
Pipe, galvanized iron:				
1¼ in. diameter	3.54	X		
½ in. diameter	1.65	X		
Kitchen sink	4.05	X		
Bathtub	4.21	X		
Toilets	2.34	X		
Mixing faucet	2.73	X		
Drop siding:				
Pine, C and better	.32			X
Pine, under C	.24			X
Fir, under C	.19			X
Bevel siding:				
Pine, C and better	.41			X
Pine, under C	.21			X
Cedar, B	.28			X
Flooring:				
Yellow pine, under C	.44			X
Fir, B and B	.36			X
Fir, under B	.23			X
Linseed oil	.28			X
Total	275.96	15		10
½ percent of total	1.38			
Auto and auto supplies:				
Used vehicles:				
Automobiles	52.10	X		
Pickup truck	5.29	X		
New pickup truck	11.90	X		
Antifreeze	2.56	X		
Lubrication	6.60	X		
Motor tuneup	25.86	X		
Inner tubes	1.13			X
Batteries, 51-plate	.68			X
Spark plugs	1.26			X
Total	408.79	6		3
½ percent of total	2.04			
Feed:				
Sorghum grain	8.75	X		
Turkey growing mash	15.18	X		
Mixed dairy feed:				
14 percent protein	13.89		Mixed dairy feed (under 29 percent protein).	
16 percent protein	47.91		do	
18 percent protein	14.36		do	
20 percent protein	12.05		do	
24 percent protein	5.77		do	
Soybean meal: 44 percent protein	8.69		All soybean meal	
Cottonseed meal: 41 percent protein	23.76		All cottonseed meal	
Mixed hog feed:				
14–18 percent protein	42.48	X		
Over 29 percent protein	36.19	X		
Beef cattle supplement: 30 percent protein	33.68	X		
Wheat	2.38			X

See footnotes at end of table.

TABLE 5.—*The parity index: Items added and dropped, January 1959 revision*—Continued

Item	1955 average expenditure per farm	Added new	Substituted for—	Dropped
Feed—Continued	*Dollars*			
Meat scrap	1.47			X
Tankage	1.36			X
Corn gluten	1.36			X
Hominy feed	.84			X
Mill run	.70			X
Total	907.00	5	7 for 3	6
½ percent of total	4.54			
Livestock—no changes:				
Total	327.00			
½ percent of total	1.64			
Motor supplies:				
Tractor tires	13.31	X		
Antifreeze	5.73	X		
Motor tuneup	34.26	X		
Lubrication	7.51	X		
Kerosene	.31			X
Inner tubes	1.96			X
Total	597.16	4		2
½ percent of total	2.99			
Motor vehicles:				
Used vehicles:				
Autos	33.90	X		
Pickups	13.95	X		
Trucks	5.16	X		
Crawler tractors under 25 hp	.10			X
Total	311.75	3		1
½ percent of total	1.56			
Farm machinery:				
Disk plow, 2 disks	2.79	X		
1-way disk tiller	2.05	X		
Disk harrow, tandem, 6 ft	4.14	X		
Disk harrow, tandem, 8 ft	4.52	X		
Disk harrow, offset, 7 ft	1.91	X		
Springtooth harrow, 2 section	2.82	X		
Cultivator, 4-row, tractor	2.45	X		
Manure loader, tractor	3.84	X		
Corn planter, 2-row, fertilizer	6.45		2 row plain	
Corn planter, 4-row, plain	2.14		do	
Mower, tractor, 6 ft	4.87	X		
Hay rake, side-delivery, PTO	7.26	X		
Pickup baler, auxiliary engine	27.2		PTO model	
Combine, auxiliary engine, 5–6 ft	10.3	X		
Combine, PTO, 7–9 ft	3.02		Auxiliary engine 8 ft	
Combine spreader, 10 ft	10.3	X		
Combine spreader, 14 ft	8.39	X		
Corn picker-husker, 1 row	6.98	X		
Cotton picker, less tractor	2.01	X		
Cotton picker, spreader	2.31	X		
Farm milk cooler	1.12	X		
Bulk milk cooler	9.70	X		
Gas engine (2.1–3.5 hp.)	2.97		1–2 hp	
Farm grain elevator, 28 ft	2.93	X		
Farm grain elevator, 34 ft	4.51	X		
Farm grain elevator, 40 ft	3.04	X		
Cream separator	.71			X
Stationary milker installation [1]	2.10			X
Total	370.64	21	5 for 4	2
½ percent of total	1.35			

See footnotes at end of table.

TABLE 5.—*The parity index: Items added and dropped, January 1959 revision*—Continued

Item	1955 average expenditure per farm	Added new	Substituted for—	Dropped
	Dollars			
Farm supplies:				
Gasoline	3.48	X		
Kerosene	19.70	X		
Fuel oil	3.86	X		
Soft coal	1.83	X		
DDT	38.41	X		
2–4D	10.06	X		
Burlap sacks	4.90	X		
Open mesh bags	.88	X		
Bushel hampers	7.09	X		
Fruit box shook	2.52	X		
Lug box shook	1.37	X		
Vegetable crate shook	3.33	X		
Barbed wire	5.87	X		
Baler twine	2.31	X		
Muslin	3.81	X		
Gas engines	7.46	X		
Electric motors	5.19	X		
Brooders	3.30	X		
Milk coolers	1.84	X		
Telephone service	13.29	X		
Magazines	2.51	X		
Postage rates	2.55	X		
Paris green	n.a.			X
Calcium arsenate	.27			X
Scythes	n.a.			X
Horse collars	.45			X
Total	261.06	22		4
½ percent of total	1.31			
Building and fencing materials:				
Flooring, yellow pine	3.34	X		
Paint, interior	2.99	X		
Concrete blocks	18.61	X		
Insulating board, interior	2.84	X		
Domestic water system	12.58	X		
2 by 4's, pine, under No. 2	1.03			X
Shiplap	1.38			
No. 2 and better	n.a.			X
Under No. 2	n.a.			X
Drop siding	.84			
Pine, under C	n.a.			X
Fir, under C	n.a.			X
Barn window sash	1.70			X
Linseed oil	n.a.			X
Brick, common	.69			X
Poultry netting	1.28			X
Steel gates	.92			X
Windmills	1.26			X
Total	369.52	5		11
½ percent of total	1.85			
Fertilizer and lime:				
Mixed goods:				
0–14–14	1.70	X		
5–20–20	10.40	X		
8–16–16	2.63	X		
12–12–12	6.63	X		
6–6–6	.68			X
8–24–8	1.50			X
8–32–0	1.25			X
10–20–0	1.86			X
6–10–4	1.01			X
Gypsum	2.59	X		

See footnotes at end of table.

TABLE 5.—*The parity index: Items added and dropped, January 1959 revision*—Continued

Item	1955 average expenditure per farm	Added new	Substituted for—	Dropped
Fertilizer and Lime—Continued				
Superphosphate:	*Dollars*			
18 percent P_2O_5	1. 01			X
42 percent P_2O_5[2]	3. 47			X
Total	291. 52	5		7
½ percent of total	1. 46			
Seed:				
Ladino clover	. 95	X		
Tall fescue	1. 71	X		
Grain sorghum	2. 92	X		
Peanuts	4. 74	X		
Rice	1. 40	X		
Flax	1. 58	X		
Cottonseed	6. 23	X		
Cowpeas	. 17			X
Alfalfa, southern	. 50			X
Austrian winter peas	n.a.			X
Total	181. 48	7		3
½ percent of total	. 91			
Total of all groups (including duplications)		120	16 for 9	62

[1] Weight for stationary milker installations assigned to single milker units because of the lack of data on stationary installations.

[2] Entire weight for over 22 percent superphosphate assigned to 45 percent, the item for which most returns have been tabulated in recent years. Data not available to show distribution of purchases as between 42 and 45 percent superphosphate.

AGRICULTURAL MARKETING SERVICE

In order to measure postal rates more adequately, both parcel post and first-class rates were included. Can milk coolers were retained, similarly, to supplement the bulk cooler coverage in the dairy equipment field. And two analyses of mixed fertilizer qualifying for inclusion in 1955 were dropped because of sharply declining usage in the years immediately following 1955.

A further comparison in terms of commodity contribution to the index for December 1958 is presented in table 6. This table compares the old Prices Paid, Interest, and Taxes Index (pre-1950 formula still used for computing parity prices for commodities not yet on the Modernized Formula), the 1950 revision, and 1959 revision. The first of these indexes is based on only 183 price series, so that the average percentage contribution of one commodity to the total of 100 percent will generally be higher than for commodities in the 1950 revision, and this in turn will average slightly higher than in the 1959 revision. The latter has a broader and more representative coverage; at the same time, individual commodities will in general affect the total index less than in the other indexes. Thus the last revision may be expected to be more stable, and less affected by an unusual gyration of a given item. A perusal of this table will indicate the greater susceptibility of the pre-1950 index and the 1950 revision as well, to undue effects of wide price fluctuations for one or two volatile items.

Table 7 presents the quantity weights as computed from the weight base data, for all three weight base periods.

Formula and Method of Computation

The formula of this index, is, as already indicated, similar to that of the 1950 revision, except for the addition of one more link. Thus, the index is basically an aggregative index, modified from the traditional Laspeyres formula (1) to permit reflecting changes over time in the importance of commodities (by chaining together several "links," each link consisting of an index computed using as a base period the period from which the weights were derived); (2) to introduce (or drop) from time to time commodities for which satisfactory data were not available over the whole period covered by the various "links;" and (3) to impute to the weights of commodities in the index an allowance for similar or related items for which price series were not available.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
	Percent	*Percent*	*Percent*
Family living	49. 80	42. 40	39. 24
Food and tobacco	16. 3	16. 7	13. 48
Meat and fish	(4. 70)	(3. 78)	(3. 34)
Round steak	3. 07	1. 25	. 54
Hamburger	-------	. 36	. 41
Chuck roast	-------	-------	. 21
Frying chicken	-------	-------	. 18
Bologna	-------	. 48	. 39
Frankfurters	-------	-------	. 25
Bacon, sliced	. 41	. 44	. 44
Ham, whole	-------	. 20	. 26
Pork chops	1. 22	. 23	. 17
Pork sausage	-------	. 13	. 16
Frozen haddock	-------	-------	. 19
Salmon, pink	-------	. 69	. 14
Fats	(. 21)	(. 66)	(. 63)
Lard	. 21	. 30	. 15
Vegetable shortening	-------	. 19	. 26
Margarine	-------	. 17	. 22
Dairy products and eggs	(1. 17)	(1. 44)	(1. 90)
Milk, fluid	-------	. 25	. 51
Milk, evaporated	-------	. 13	. 14
Butter	. 91	. 60	. 32
Cheese, American	. 26	. 38	. 32
Ice cream	-------	-------	. 44
Eggs	-------	. 08	. 17
Cereal and bakery products	(4. 74)	(4. 12)	(2. 52)
Flour	3. 33	1. 51	. 59
Baking powder	. 08	. 25	. 16
Cake mix	-------	-------	. 12
Soda crackers	-------	. 26	. 24
Bread, white	. 64	1. 16	1. 01
Cornmeal	. 30	. 39	. 12
Cornflakes	-------	. 21	. 20
Rolled oats	. 22	. 20	. 08
Rice	. 17	. 14	[1]
Vegetables	-------	(1. 61)	(1. 35)
Corn, canned	-------	. 23	. 16
Peas, canned	-------	. 12	. 16
Beans, dry	-------	. 24	. 13
Potatoes, white	-------	. 41	. 32
Cabbage	-------	. 15	. 15
Lettuce	-------	. 17	. 21
Tomatoes	-------	. 29	. 10
Catsup	-------	-------	. 12
Fruit	(1. 67)	(1. 59)	(. 94)
Apples	. 99	. 73	. 08
Bananas	. 36	. 28	. 19
Lemons	. 13	. 08	[1]
Oranges	. 19	. 50	. 33
Peaches, canned	-------	-------	. 20
Pineapple, canned	-------	-------	. 14
Salt	(. 15)	-------	-------
Sweets	(1. 87)	(1. 20)	(. 78)
Sugar	1. 87	. 66	. 44
Sirup, table	-------	. 44	. 18
Candy, nonchocolate	-------	. 10	. 16
Beverages	(1. 79)	(1. 48)	(1. 16)

[1] Item dropped; represented only 0.4 percent of food and tobacco total in 1955.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Family living—Continued			
Beverages—Continued	*Percent*	*Percent*	*Percent*
Coffee, ground	1. 40	1. 32	. 48
Coffee, instant	-------	-------	. 09
Tea	. 39	. 16	. 11
Cola drinks	-------	-------	. 25
Beer	-------	-------	. 23
Tobacco	-------	(. 81)	(. 86)
Smoking tobacco	-------	. 49	. 19
Cigarettes	-------	. 32	. 67
Clothing	16. 0	9. 7	6. 31
Men's clothing	(11. 76)	(3. 90)	(2. 53)
Overalls, bib	1. 50	. 41	. 32
Shirts, cotton, work	1. 28	. 28	. 13
Undershirts, sleeveless	. 17	. 07	. 10
Shorts	. 20	. 08	. 10
Unionsuits, heavy, cotton	. 50	. 20	. 09
Gloves, canvas	. 31	. 07	. 18
Socks, cotton	. 37	. 16	. 16
Trousers, cotton	-------	. 21	. 07
Shirts, broadcloth	-------	. 28	. 17
Jackets, wool	-------	. 13	. 15
Suits, wool	2. 92	. 53	. 28
Trousers, extra, woolen	1. 00	. 12	. 08
Overcoats	-------	. 14	. 08
Hats, felt	. 79	. 20	. 13
Jackets, leather	-------	. 05	-------
Shoes, work	2. 41	. 52	. 20
Boots, rubber, knee length	. 31	. 05	. 07
Shoes, dress	-------	. 33	. 17
Overshoes, with buckles	-------	. 04	. 05
Overshoes, no buckles	-------	. 03	-------
Boys' clothing	-------	(. 90)	(. 57)
Overalls, waist	-------	. 38	. 20
Suits, wool	-------	. 15	. 12
Sweaters, wool	-------	. 11	. 07
Shoes	-------	. 26	. 18
Women's clothing	(3. 64)	(3. 51)	(2. 39)
Dresses, house, percale	1. 50	. 25	. 19
Dresses, street, cotton	-------	. 39	. 17
Nightgowns, cotton	-------	. 13	. 16
Hose, cotton	-------	. 09	-------
Hose, nylon	. 25	. 11	. 21
Hats, straw	-------	. 04	-------
Coats:			
Lightweight, full length	-------	. 43	. 20
Heavy, all wool, with fur trim	-------	. 13	-------
Heavy, all wool, without fur trim	-------	. 20	. 15
Sweaters	-------	. 06	. 26
Hats, felt	-------	. 09	. 22
Dresses, rayon	-------	. 63	. 15
Panties or briefs	. 17	. 04	. 10
Slips, rayon	-------	. 23	. 06
Slips, nylon	-------	-------	. 15
Shoes	1. 72	. 69	. 37
Girls' clothing	-------	(1. 04)	(. 53)
Dresses, wash	-------	. 63	. 28
Coats, heavy, wool	-------	. 18	. 10
Shoes	-------	. 23	. 15

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Clothing—Continued	*Percent*	*Percent*	*Percent*
Yard goods	(. 60)	(. 35)	(. 29)
Percale	. 28	. 24	
Gingham		. 11	. 29
Muslin, unbleached	. 32		
Household operation	[2] 4. 50	4. 30	5. 73
Fuel	(2. 75)	(1. 84)	(1. 75)
Coal, soft, prepared sizes	1. 47	. 50	. 27
Coal, soft, run of mine		. 45	. 12
Coal, hard	. 38	. 30	. 09
Furnace oil			. 57
Kerosene	. 40	. 34	. 14
Gasoline, filling station		. 07	. 50
Wood	. 50	. 18	. 06
Brooms	(. 11)		
Services		(1. 20)	(2. 22)
Electricity		. 38	1. 26
Telephone		. 33	. 47
Newspapers		. 49	. 37
Magazines			. 12
Laundry items	(. 40)	(1. 26)	(1. 17)
Starch, laundry	. 04	. 08	. 19
Laundry detergents	. 20	. 76	. 38
Soap, toilet	. 16	. 42	. 60
College tuition			. 43
Postage, 1st class			. 13
Parcel post			. 03
Household furnishings	3. 30	3. 40	3. 73
Electrical appliances	(. 28)	(. 93)	(2. 01)
Floor lamps		. 08	. 10
Radios, table model		. 14	. 16
Radio phonograph, console		. 09	
TV receiver, 17 in			. 13
TV receiver, 21 in			. 56
Refrigerators			
8 ft			. 03
9 ft		. 22	
10 ft			. 04
11 ft			. 08
Home freezers			
12 ft			. 07
14 ft			. 05
16 ft			. 05
18 ft			. 09
Washing machines, wringer type	. 14	. 17	. 15
Washing machines, automatic	. 07	. 06	. 12
Sewing machines	. 07	. 05	. 07
Vacuum cleaners		. 03	. 06
Irons		. 02	. 05
Stoves, electric		. 07	. 16
Toasters, pop-up			. 04
Household equipment	(. 79)	(. 79)	(. 43)
Stoves, gas		. 13	. 14
Stoves, wood or coal	. 59	. 36	. 04
Kitchen cabinets	. 12	. 06	. 04
Dinner plates	. 05	. 05	. 07
Water glasses		. 02	

[2] Includes auto supplies (1.24) later moved to Autos and Auto Supplies.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Household furnishings—Con.			
Household equipment—Con.	*Percent*	*Percent*	*Percent*
Brooms		. 13	. 06
Fruit jars	. 03	. 04	. 08
Bedding and furniture	(1. 66)	(. 86)	(. 70)
Mattresses			
Innerspring		. 08	. 09
All felted, cotton	. 18	. 04	
Bedsprings	. 17	. 03	
Bedsteads	. 14	. 05	. 05
Bedroom suites	. 20	. 17	. 13
Living-room suites	. 50	. 28	. 21
Dining-room suites	. 47	. 09	. 09
Occasional chairs		. 12	. 07
Dinette sets			. 06
Rugs	(. 26)	(. 29)	(. 23)
Axminster	. 19	. 16	. 13
Felt base	. 07	. 13	. 10
Household textiles	(. 31)	(. 53)	(. 36)
Sheets:			
81 by 99	. 09	. 15	. 05
81 by 108			. 04
Blankets, wool		. 04	. 04
Blankets, cotton	. 15	. 13	. 07
Bath towels		. 04	. 04
Toweling, cotton	. 07	. 04	
Muslin, unbleached		. 04	
Curtains, kitchen		. 09	. 10
Toweling, part linen			. 02
Building materials, house	5. 30	2. 0	4. 26
Lumber (including wood shingles)	(3. 22)	(1. 12)	(1. 42)
Framing 2 by 4 in	(. 60)	(. 30)	(. 63)
Pine, No. 2 and better	. 20	. 10	. 14
Pine, under No. 2	. 07	. 03	. 05
Fir, No. 2 and better	. 28	. 14	. 36
Fir, under No. 2	. 05	. 03	. 08
Boards 1 in. random width	(. 37)	(. 20)	(. 30)
Rough, No. 2 and better	. 24	. 09	. 10
Rough, under No. 2	. 13	. 05	. 05
Dressed, No. 2 and better		. 03	. 12
Dressed, under No. 2		. 03	. 03
T&G roofers, No. 2 and better			. 04
Shiplap, pine	(. 47)	(. 16)	(. 16)
No. 2 and better	. 28	. 10	. 10
Under No. 2	. 19	. 06	. 06
Drop siding, pat. 105–106		(. 07)	(. 03)
Pine, C and better		. 02	
Pine, under C		. 02	
Fir, C and better		. 02	. 03
Fir, under C		. 01	
Bevel siding, weather board	(. 68)	(. 04)	(. 04)
Pine, C and better	. 31	. 02	
Pine, under C	. 19	. 01	
Cedar, clear	. 13	. 01	. 04
Cedar, B	. 05		

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Building materials—Con.			
T & G roofers—Continued	*Percent*	*Percent*	*Percent*
Flooring	(.36)	(.19)	(.18)
Yellow pine, B and better	.24	.07	.03
Yellow pine, under B	.12	.03	
Fir, B and better		.06	
Fir, under B		.03	
Oak, select			.08
Oak, No. 1			.07
Shingles, wood, cedar clear (including lumber)	.74	.16	.04
Composition material (including plywood)	(.16)	(.21)	(.64)
Asphalt shingles, MS. 3 in 1		.10	.20
Composition, roll roofing		.02	.06
Asbestos siding shingles			.04
Gypsum board	.16	.07	.12
Insulating board		.02	.16
Plywood, interior			.06
Millwork:			
Doors—Interior	(.50)	(.13)	(.57)
2 panel fir	.10	.02	.07
Flush hollowcore	.07	.01	.07
House windows, check rail units	.33	.10	.26
Kitchen cabinets			.17
Masonry	(.53)	(.12)	(.44)
Brick, common	.42	.03	.10
Brick, face			.04
Concrete blocks		.01	.12
Portland cement	.11	.08	.18
Paint and Oil	(.73)	(.31)	(.43)
House paint, ready mix	.73	.28	.22
Interior wall paint			.21
Linseed oil		.03	
Iron and Steel	(.16)	(.11)	(.19)
Nails, 8d. common	.08	.05	.11
Screen wire, 16 mesh, 30 in. width	.08	.02	.02
Galvanized steel roofing, 28–29 gage		.04	.06
Plumbing			(.46)
Galvanized iron pipe 1¼ in			.10
Galvanized iron pipe ½ in			.05
Kitchen sink, single, without fixtures			.10
Bath tub, 5 ft. enamel cast iron			.09
Toilet, water, china			.05
Mixing faucet, sink, chrome plate			.07
Electric cable, indoor, 2 wire, nonmetal sheath			.11
Autos and auto supplies	[1](5.64)	6.30	5.73
Autos	4.40	(3.86)	(2.62)
New:			
6 cylinder		1.62	.34
8 cylinder		2.24	1.47

[1] Auto supplies (1.24) included in Household Operation Total.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Auto and auto supplies—Con.			
Autos—Continued	*Percent*	*Percent*	*Percent*
Used			.81
Pickup truck, ½ ton:			
New			.22
Used			.09
Supplies:			
Gasoline	.81	1.85	1.68
Motor oil	.18	.21	.14
Auto tires 600 by 16	.25	.29	.33
Inner tubes		.05	
Storage batteries 15 plate		.02	.07
17 plate		.02	
Antifreeze, permanent			.03
Services:			
Lubrication			.11
Motor tuneup, Ford, Chevrolet, Plymouth			.44
Farm production	35.70	36.90	50.23
Feed	6.20	8.20	11.30
Hay, alfalfa	.93	.43	.70
Hay, other		.39	.50
Corn	.95	.56	1.18
Oats	.17	.30	.45
Barley		.08	.11
Wheat		.12	
Grain sorghum			.11
Cottonseed meal	.80	.63	
Cottonseed meal, 41 percent protein			.36
Soybean meal		.16	
Soybean meal, 44 percent protein			.13
Linseed meal	.19		
Meat scrap	.14	.08	
Tankage		.09	
Bran	.78	.36	.09
Middlings	.78	.34	.10
Mill run		.07	
Cornmeal	.56	.11	.10
Corn gluten	.21	.04	
Turkey growing mash			.22
Hominy feed		.17	
Scratch grain		.42	.21
Laying mash		1.04	1.84
Chick starter mash		.31	.37
Broiler growing mash		.71	1.39
Mixed dairy, under 29 percent protein		1.18	
Mixed dairy, 29 percent protein		.38	
Mixed dairy, 14 percent protein			.21
Mixed dairy, 16 percent protein	.60		.71
Mixed dairy, 18 percent protein			.21
Mixed dairy, 20 percent protein			.18

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.			
Feed—Continued			
Mixed dairy, 24 percent protein	*Percent*	*Percent*	*Percent* .08
Mixed dairy, over 29 percent protein			.26
Stock salt	.09	.23	.11
Mixed hog feed, 14–18 percent protein			.63
Mixed hog feed, over 29 percent protein			.55
Beef cattle concentrate, 30 percent protein			.50
Feeder livestock		6.00	5.52
Feeders and stockers		(5.20)	(4.67)
Cattle and calves		4.70	4.42
Lambs		.45	.18
Hogs		.05	.07
Dairy cattle		.27	.06
Baby chicks		.46	.68
Turkey poults		.07	.11
Motor supplies	[4]	3.50	8.23
Gasoline	(1.12)	(2.11)	(5.93)
Filling station	1.12	1.54	1.66
Tank truck		.57	3.81
Kerosene	.15	.06	
Tractor fuel, diesel		.37	.46
Oil, motor	.35	.32	.41
Grease		.03	.14
Tires	(.39)	(.49)	(.70)
Auto	.39	.26	.23
Truck, 8 ply		[5] .23	.11
Truck, 10 ply			.15
Tractor			.21
Inner tubes		.04	
Batteries	(——)	(.06)	(.15)
45 plate		.03	.10
51 plate		.03	.05
Spark plugs		.05	.06
Antifreeze			.08
Motor tuneup			.63
Lubrication			.13
Motor vehicles	6.40	5.60	4.79
New automobiles, 4 door sedan	4.60	(1.67)	(1.05)
6 cylinder		.69	.20
8 cylinder		.98	.85
Used automobiles			.48
New trucks	1.38	(1.19)	(.73)
2 ton		.43	.18
½ ton pickup		.76	.55
Used trucks			(.30)
1½–2 ton			.09
½ ton pickup			.21
Tractor	.42	(2.74)	(2.08)
Wheel, under 20 belt hp		.54	.04
Wheel, 20–29 belt hp		1.48	.15
Wheel, 30–39 belt hp		.42	1.89
Crawler, under 25 drawbar hp		.06	

[4] Included in Farm Supply Index.
[5] Includes all ply of truck tires.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.			
Motor vehicles—Con.			
Tractor—Continued			
Crawler, 25–34.9 drawbar hp	*Percent*	*Percent* .10	*Percent* .05
Crawler, 35–49.9 drawbar hp		.14	.10
Farm machinery	5.20	4.50	5.63
Plows, tractor, 2-bottom	.27	.38	.20
Plows, tractor, 3-bottom		.08	.10
Plows, tractor, 2 disk			.06
One-way disk tillers			.04
Disk harrows, single		.08	.05
Disk harrows, tandem, 6 ft			.09
Disk harrows, tandem, 7 ft	.22	.13	.07
Disk harrows, tandem, 8 ft			.10
Disk harrows, offset, 7 ft			.04
Spiketooth harrows, 1 section	.12	.05	.14
Springtooth harrows, 2 section	.09		.07
Cultivators, 2 row, tractor	.40	.34	.13
Cultivators, 4 row, tractor			.05
Manure spreaders	(.40)	(.20)	(.16)
Manure spreader, 70 bu., traction	.10	.05	.04
Manure spreader, 95 bu., traction	.12	.06	.05
Manure spreader, 95 bu. PTO	.07	.04	.03
Manure spreader, 140 bu. PTO	.11	.05	.04
Tractor manure loaders			.09
Planters, corn, 2 row	.18	.11	.14
Planters, corn, 4 row, plain			.05
Planters, corn and cotton, 2 row	.06		
Grain drills, fertilizer, 13 tube	.29	.27	.12
Grain drills, plain, 16 tube		.12	.11
Mowers, tractor, 6 ft			.11
Mowers, tractor, 7 ft			.14
Mowers, tractor (mounted or drawn)	.31	.30	
Hay rakes, side delivery, PTO			.10
Hay rakes, side delivery, traction operated			.07
Hay rakes, side delivery	.20	.11	
Pickup balers, automatic tie, PTO	.09	.07	

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.			
Farm Machinery—Con.	*Percent*	*Percent*	*Percent*
Pickup balers, auxiliary engine			.52
Combines, 10 ft., self-propelled			.22
Combines, 12 ft., self-propelled		.27	.19
Combines, 14 ft., self-propelled			.20
Combines, 5–6 ft., auxiliary engine	1.31	.55	.22
Combines, 8 ft., auxiliary engine		.21	
Combines, 5–6 ft., PTO			.20
Combines, 7–9 ft., PTO			.07
Forage harvesters, pick-up, PTO		.09	.12
Forage harvesters, row crop	.24	.05	.14
Corn picker-huskers, 1 row			.15
Corn picker-huskers, 2 row			.19
Corn picker-huskers		.27	
Cotton picker, 1 row, less tractor			.03
Cotton picker, 1 row, self-propelled			.06
Potato diggers	.07		
Single milker units		.10	.14
Farm milk coolers, 6 can, side door			.02
Bulk milk coolers, expansion type			.20
Milker outfit pumping installation		.07	
Cream separators, 750 lb. capacity	.32	.16	
Hammer mills	.10	.11	.07
Power sprayers		.16	.11
Farm wagons	.42	.12	.24
Farm grain elevator, portable, 28 ft			.06
Farm grain elevator, portable, 34 ft			.09
Farm grain elevator, portable, 40 ft			.06
Gas engines	.11	.05	.05
Electric motors		.05	.05
Farm supplies	[6] (3.19)	2.80	3.49
Gasoline			.05
Kerosene			.30
Range or furnace oil			.06
Soft coal			.03
Calcium arsenate		.07	
Arsenate of lead	.11	.24	.03
DDT, wettable powder 40–50 percent			.53
Paris green		.02	
2, 4D			.13

[6] Combined with motor supplies in old index.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.			
Farm supplies—Con.	*Percent*	*Percent*	*Percent*
New potato sacks, burlap No. 100			.07
New bags, open mesh, approx. No. 50			.02
New baskets, round stave, 1 bu. with cover	.25	1.03	.15
New hampers, 1 bu. with cover			.12
Fruit box shook			.04
Lug box shook			.02
Veg. crate shook			.05
Hoes, 7 in. blade	.16	.05	.03
Pitchforks, 3 tine	.24	.09	.02
Pitchforks, 4 tine		.03	.02
Hand sprayer, pressure 3–4 gal. capacity		.04	.02
Nail hammers		.04	.05
Axes		.09	.03
Scythes		.02	
Barbed wire, 4 pt. galvanized, 12½ gage			.10
Iron pipe	.29	[7]	
Binder twine	.61	.32	.03
Baler twine			.14
Rope, manila	.60	.16	.03
Muslin, 36 in. unbleached			.06
Gas engines, 2.1–3.5 hp			.11
Electric motors ¼ hp			.08
Brooders, gas burning, 450–550 chick capacity			.05
Brooders, oil burning with canopy, Chick capacity 450–550		.04	.06
Brooders, electric, 450–550 chick capacity		.03	.05
Farm milk coolers, side door, 6 can			.03
Milk pails, heavy, tin plated, 12 qt	.06	.07	.08
Milk cans, 10 gal. std. wt	.37	.11	.04
Telephone, local service			.23
Electricity		.17	.52
Farm magazines, annual subscriptions			.06
1st class letter, mail			.05
Horse collars	.50	.18	
Building and fencing material	8.20	3.00	5.30
Framing lumber	(1.07)	(.31)	(.34)
Pine, No. 2 and better	.35	.10	.12
Pine, under No. 2	.13	.04	
Fir, No. 2 and better	.50	.14	.18
Fir, under No. 2	.09	.03	.04
Rough boards	(.56)	(.27)	(.39)
No. 2 and better	.35	.17	.25
Under No. 2	.21	.10	.14

[7] Included with building material in 1950 revision.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.	*Percent*	*Percent*	*Percent*
Dressed boards		(. 13)	(. 36)
No. 2 and better		. 07	. 20
Under No. 2		. 06	. 16
Shiplap, common pine	(. 36)	(. 15)	
No. 2 and better	. 22	. 09	
Under No. 2	. 14	. 06	
Drop siding	(. 73)	(. 13)	(. 09)
Pine, C and better	. 20	. 04	. 05
Pine, under C	. 18	. 03	
Fir, C and better	. 22	. 04	. 04
Fir, under C	. 13	. 02	
Flooring, yellow pine, B and B			. 07
Shingles, wood	2. 46	. 14	. 06
Windows, barn	. 12	. 03	
Shingles, asphalt		. 02	. 16
Roofing, composition	. 04	. 07	. 13
Insulating board			. 07
Paint, exterior house	. 69	. 31	. 27
Paint, interior wall			. 07
Cement, portland	. 20	. 12	. 33
Concrete blocks			. 43
Linseed oil		. 03	
Brick, common	. 20	. 07	
Nails	. 13	. 06	. 26
Roofing, galvanized	. 10	. 16	. 60
Iron pipe, galvanized		. 10	. 14
Domestic water system jet type ½ hp motor and tank			. 28
Windmills	. 07	. 03	
Fencing:			
Barbed wire, 2 pt	. 25	. 15	. 13
Barbed wire, 4 pt		. 14	. 19
Field and stock fencing		. 27	. 41
Poultry netting	. 52	. 09	
Fence posts, steel	. 28	. 05	. 16
Fence posts, wood	. 21	. 08	. 24
Farm gates	. 21	. 09	
Boards, rough, No. 2 and better			. 08
Boards, rough, under No. 2			. 04
Fertilizer	1. 70	1. 90	3. 76
Mixed fertilizer	(1. 17)	(1. 07)	(2. 37)
0–14–14			. 02
0–20–20		. 06	. 09
2–12–12		. 03	. 08
3–9–6		. 05	. 09
3–9–9		. 04	. 09
3–12–6		. 03	. 04
3–12–12	. 79	. 17	. 30
4–8–6		. 02	. 04
4–8–8		. 03	. 04
4–10–6		. 04	. 06
4–10–7		. 04	. 09
4–12–12		. 03	. 11
4–16–16		. 08	. 19
5–10–5		. 08	. 15
5–10–10	. 38	. 12	. 29
5–20–20			. 15

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 revision
Farm production—Con.			
Fertilizer—Con.			
Mixed fertilizer—Con.	*Percent*	*Percent*	*Percent*
6–6–6		. 01	
6–8–8		. 03	. 10
6–10–4		. 02	
6–12–12		. 02	. 06
8–16–16			. 04
8–8–8		. 03	. 05
8–24–8		. 02	
8–32–0		. 01	
10–10–10		. 09	. 20
10–20–0		. 02	
12–12–12			. 09
Fertilizer materials	(. 47)	(. 62)	(1. 06)
Sodium nitrate	. 12	. 06	. 11
Sulphate of ammonia	. 04	. 04	. 09
Ammonium nitrate		. 12	. 27
Ammonium nitrate-limestone mixture		. 04	. 06
Anhydrous ammonia		. 08	. 20
Ammonium phosphate, 16–20		. 06	. 09
Superphosphate:			
18 percent P_2O_5		. 02	
20 percent P_2O_5	. 30	. 06	. 08
42 percent P_2O_5		. 02	
45 percent P_2O_5		. 02	. 05
Phosphate rock		. 05	. 05
Muriate of potash	. 01	. 05	. 06
Agricultural limestone	. 06	. 21	. 29
Gypsum (land plaster)			. 04
Seed	1. 40	1. 40	2. 21
Potatoes	. 10	. 19	. 22
Soybeans		. 13	. 15
Cowpeas		. 05	
Hybrid corn		. 21	. 48
Grain sorghum			. 04
Rice			. 03
Oats		. 17	. 24
Barley		. 06	. 07
Wheat		. 14	. 21
Rye		. 05	. 03
Cottonseed	. 30		. 13
Flax			. 02
Alfalfa, common	. 25	. 08	. 03
Alfalfa, certified		(3)	. 17
Alfalfa, other improved variations		. 01	
Clover, red	. 31	. 09	. 08
Clover, sweet	. 10	. 03	. 02
Clover, alsike		. 03	. 02
Clover, Ladino			. 01
Peanuts			. 07
Lespedeza, Korean		. 03	. 05
Timothy	. 19	. 06	. 03
Kentucky bluegrass	. 15	. 02	. 01
Common ryegrass		. 01	. 03
Sudangrass		. 02	. 02
Tall Fescue (Alta-Kentucky 31)			. 03

[3] Less than 0.005 percent.

TABLE 6.—*Prices paid, interest, taxes, and wage rates: Item coverage and relative importance of each commodity and service, Dec. 15, 1958*—Con.

Group and commodity	Relative importance		
	Old index	1950 revision	1959 fevision
Farm production—Con.			
Seed—Con.	*Percent*	*Percent*	*Percent*
Austrian winter peas	---	.01	---
Vetch, hairy	---	.01	.02
Taxes	10.4	4.0	2.28
Interest	4.1	2.0	1.16
Wage rates	---	14.7	7.09
Total	100.0	100.0	100.0

AGRICULTURAL MARKETING SERVICE

With respect to the first point, the logic of the linking procedure was discussed at some length in the 1950 paper (*6*). The logical problems involved in this phase of the problem have been developed more fully in the literature—(*3*, *4*, and *5*)—and are not reviewed here, except to reaffirm the logic that accurate measures of price trends are not possible over long periods if constant weights are used. The literature amply demonstrates this fact. On the other hand, farmers' purchasing patterns probably change rather slowly, so that annual changes of weight are probably not necessary to preserve reasonably accurate measurement of price changes over a relatively short period.

As a working compromise, the use of fixed weights over the near half century covered by the index has been rejected because of the bias arising from the use of fixed weights over a long period. Instead, the total period has been divided into shorter periods as nearly homogeneous as the availability of data permits. Indexes have been prepared for each period, using the most representative weights available; and finally these units or links have been chained together, thus maintaining weights reasonably representative of the period at all times, and yet relating the price comparisons to the reference period chosen. For these indexes, the base reference period is, by law, the 5-year period 1910–14.

Conceptually then, the 1959 revision (since September 1952) may be described as:

$$I_i = \frac{\sum p_{m35}\, q_{24-39}}{1/5 \sum_{j=1910}^{1914} \sum p_j q_{24-39}} \cdot \frac{\sum p_{s52}\, q_{37-41}}{\sum p_{m35}\, q_{37-41}} \cdot \frac{\sum p_i q_{55}}{\sum p_{s52}\, q_{55}}$$

Where "I_i" denotes the Index for any date (i) after September 1952; "$m35$" denotes March 1935; and "$s52$" denotes September 1952. The "q's" here represent total quantity weights for each commodity, including all imputations, both direct and indirect.

It would be possible, of course, to compute the index directly from the above formula, with the subgroup indexes derived from the several partial sums for the commodities in the respective subgroups. Actually, it has seemed simpler to compute separate indexes for each commodity group index, and to combine the several group indexes with percentage weights which are the proportion of total expenditures represented by the commodity group, including all imputations, for the weight base period. In this form of computation, the quantity weights used as multipliers for the price series reflect only the direct imputations, that is, imputations for commodities assigned to the particular price series. The indirect imputations are taken care of in the determination of the percentage weights for combining the group indexes. (Examples of indirect imputations for the living group are medical expenses and personal insurance, and for the production group, custom work and marketing charges, as already discussed.)

The combination of the group indexes by percentage weights must be made in terms of the indexes computed on the same base period as that from which the weights are derived, and then converted to the 1910–14 reference date. For a proof see (*6*). When handled in this manner the resulting index is mathematically equivalent to the formula presented earlier in this section.

With respect to the second point under the head of "Formula and Method of Computation" (p. 51), it is frequently necessary to substitute one price series for another, owing to changes in usage or marketing practices; for, as a result of an expansion of the price collection program, new price series may become available.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions* [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Food and tobacco:	*Number*	*Number*	*Number*
Meat:			
Round steak—pounds	76. 74	45. 1	38. 3
Hamburger (beef)—do	----------	20. 9	46. 7
Chuck roast—do	----------	----------	22. 3
Frying chicken—do	----------	----------	28. 9
Bologna—do	----------	26. 8	43. 7
Frankfurters—do	----------	----------	26. 4
Bacon, sliced—do	14. 679	23. 1	45. 2
Ham, whole (not sliced)—do	----------	10. 3	26. 3
Pork chops—do	37. 57	10. 2	14. 8
Pork sausage—do	----------	8. 1	19. 1
Fresh frozen haddock—do	----------	----------	22. 8
Salmon, pink (16-oz. can)—do	----------	37. 4	14. 7
Fats and oils:			
Lard—do	22. 0	46. 3	44. 4
Vegetable shortening—do	----------	18. 8	51. 6
Margarine—do	----------	20. 2	51. 0
Dairy products:			
Milk, fluid—quarts	----------	34. 5	137. 0
Evaporated milk—1-lb. can	----------	27. 0	[3] 58. 8
Butter—pound	28. 04	26. 6	27. 9
Cheese, American—do	10. 0	21. 2	36. 1
Ice Cream—½ gal	----------	----------	33. 3
Eggs—doz	----------	4. 9	19. 6
Cereal and bakery products:			
Flour—25-lb. sack	36. 0	23. 5	18. 2
Bread, white—pound	79. 5	207. 0	358. 0
Soda crackers—do	----------	30. 1	54. 5
Cornmeal—do	91. 0	172. 0	105. 0
Cornflakes—do	----------	20. 3	39. 3
Rolled oats—do	31. 0	39. 6	33. 0
Baking powder—do	7. 330	32. 4	41. 1
Cake mix—do	----------	----------	26. 3
Rice—do	20. 6	25. 0	----------
Vegetables:			
Catsup—bottle	----------	----------	37. 3
Corn, canned—No. 303 can	----------	44. 5	61. 0
Peas, canned—do	----------	21. 7	58. 0
Potatoes, white—10-lb	----------	30. 1	46. 7
Beans, navy—pounds	----------	46. 9	48. 9
Cabbage—do	----------	72. 5	146. 0
Lettuce—head	----------	27. 2	69. 0
Tomatoes, fresh—pounds	----------	33. 1	22. 9
Fruit:			
Apples, fresh—do	172. 19	184. 0	40. 8
Bananas—do	46. 8	52. 1	71. 7
Oranges, 216's—dozen	8. 2	30. 8	40. 1
Peaches—No. 2 can	----------	----------	37. 6
Pineapples, sliced, Hawaiian—do	----------	----------	25. 2
Lemons, 360's—dozen	5. 599	5. 3	----------
Sweets:			
Sugar—10 pounds	38. 878	19. 8	26. 0
Sirup, table—pound	----------	81. 0	67. 8
Candy, nonchocolate, without nuts—do	----------	9. 3	30. 1
Beverages:			
Coffee, ground—do	39. 0	53. 0	38. 3
Instant coffee—do	----------	----------	5. 38
Tea, Orange Pekoe—do	5. 3	3. 2	4. 42
Cola drinks, 10–12 oz—6-pack	----------	----------	44. 5
Beer, 10–12 oz—do	----------	----------	13. 4
Tobacco:			
Smoking tobacco—pound	----------	11. 6	8. 89
Cigarettes—pack of 20	----------	43. 7	183. 0
Salt—pound	228. 2	----------	----------

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Clothing:			
Men's clothing:	*Number*	*Number*	*Number*
Work:			
Overalls, bib—pair	4. 92	3. 82	5. 46
Shirts, cotton work—each	7. 31	4. 46	3. 70
Shorts—do	2. 94	3. 20	7. 46
Undershirts, sleeveless—do	2. 94	3. 20	8. 48
Union suits, heavy, cotton, winter—do	2. 12	2. 41	2. 02
Gloves, work, canvas—pair	10. 0	6. 81	30. 0
Jackets:			
Wool—each		. 31	. 641
Leather—do		. 08	
Socks, cotton work—pair	13. 0	16. 2	29. 1
Shoes, work—do	3. 55	2. 15	1. 52
Boots, rubber, knee length—do	. 520	. 25	. 577
Other clothes:			
Suits, wool, 1 pair pants—each	. 781	. 40	. 386
Extra trousers:			
Wool—pair	1. 07	. 37	. 466
cotton—do		1. 64	. 943
Shirts, broadcloth—each		2. 90	3. 33
Overcoats, winter, all wool—do		. 117	. 120
Hats, felt—do	1. 34	. 96	1. 13
Shoes, dress—pair		1. 15	1. 06
Overshoes:			
With buckles or zippers—do		. 19	. 462
Without buckles—do		. 28	
Boys' clothing:			
Boys' suits, wool, 6–12 yrs—each		. 25	. 362
Overalls, boys, waist—pair		5. 53	5. 25
Sweaters, part wool, pullovers—each		. 958	1. 20
Shoes or oxfords, 2½–6—pair		1. 44	1. 82
Women's clothing:			
Dresses:			
House, percale—each	5. 29	2. 52	3. 40
Street, cotton—do		2. 08	1. 68
Rayon, medium quality—do		2. 51	1. 08
Briefs or panties, rayon—do	3. 24	2. 17	9. 76
Slips:			
Rayon—do		3. 09	1. 41
Nylon—do			2. 49
Nightgowns, cotton—do		1. 63	3. 68
Coats:			
Lightweight, full length—do		. 537	. 448
All new wool, fur trim—do		. 085	
All wool, heavy—do		. 202	. 270
Sweaters, wool—do		. 36	2. 79
Hats:			
Felt—do		. 83	3. 50
Straw—do		2. 11	
Hose:			
Nylon, full fashioned—pair	2. 82	3. 39	12. 0
Cotton—do		5. 12	
Shoes or oxfords—do	3. 46	3. 93	3. 91
Girls' clothing:			
Dresses, wash cotton, 7–14—each		5. 63	4. 55
Coats, heavy all wool—do		. 365	. 347
Shoes, oxfords, and ties—pair		1. 59	1. 95
Yard goods:			
Percale—yard	6. 927	17. 1	
Gingham (yard goods) 36 in. width—do		5. 34	24. 5
Muslin (unbleached)—do	12. 24		

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Household operation:			
Fuel:			
Coal:	*Number*	*Number*	*Number*
Bituminous:			
Prepared sizes—ton	2.364	.83	.829
Run of mine—do		.80	.368
Anthracite—do	.44	.36	.200
Kerosene—gallon	63.0	55.80	42.8
Furnace or fuel oil—do			194.
Gasoline, filling station—do	[4] 77.0	7.36	[5] 90.1
Wood—cord	1.13	.42	.234
Electricity—kilowatt-hour		473.00	2890.
Telephone—month		2.45	6.36
Reading matter:			
Magazines—year			2.02
Newspapers, daily and weekly combined—do		1.39	1.96
Laundry supplies:			
Starch—pounds	6.16	12.50	56.5
Soap flakes—do	19.3		
Detergents—do		81.1	75.5
Toilet soap, regular—cake	42.0	114.5	302.0
College tuition and fees—year			.110
First class letter mail—letter			185.0
Parcel post, zones 1 and 2—7½ lb			3.59
House brooms—each	2.3		
Auto supplies:			
Auto tires, 6.70 by 15—each	.346		
Motor oil—gallons	4.2		
Household furnishings:			
Electrical appliances:			
Floor lamps—each		.149	.389
Radios, table model—do		.169	.407
Radio-phonograph, console—do		.0215	
Television sets, table model:			
17 inch—do			.0498
21 inch—do			.166
Refrigerators:			
8 cu. ft—do			.0100
9 cu. ft—do		.03074	
10 cu. ft—do			.0112
11 cu. ft—do			.0187
Home freezers:			
12 cu. ft—do			.0168
14 cu. ft—do			.0102
16 cu. ft—do			.0103
18 cu. ft—do			.0164
Washing machines, 8–10 lb. capacity:			
Wringer type—do	.02556	.0389	.070
Automatic—do	.00692	.0076	.0315
Sewing machines, electric—do	.0128	.0105	.0324
Vacuum cleaners, tank type—do		.0174	.061
Irons, standard size—do		.0496	.396
Toasters, pop-up—do			.154
Household equipment:			
Stoves:			
Electric, 4-top heating unit—do		.00917	.0450
Gas, 4 burner, built-in oven—do		.02409	.0551
Wood or coal burning, 6-hole—do	.12	.08946	.020
Kitchen cabinets, top cupboard—do	.05	.0290	.0426
Dinner plates, plain—½ dozen	1.0	1.172	3.70
Water glasses, plain—do		.956	
Brooms—each		2.827	2.76
Fruit jars—dozen	.5	1.005	3.89

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Household furnishings—Continued			
Bedding and furniture:	*Number*	*Number*	*Number*
Mattresses, 54 in.:			
Inner spring—each		.059	.134
All felted, cotton—do	.2	.055	
Bed springs, double bed—do	.2	.049	
Bedsteads, metal, double—do	.2	.080	.180
Bedroom suites, 3 pieces—do	.02849	.030	.0489
Living-room suites, 2 pieces—do	.0646	.045	.0743
Occasional chairs—do		.091	.110
Dining-room suites, 8 pieces—do	.0456	.011	.0223
Dinette sets—do			.0466
Floor covering, rugs, 9 by 12 ft.:			
Axminster—do	.067	.067	.119
Felt base—do	.145	.348	.608
Household textiles:			
Sheets:			
81 by 99 in—do	1.09	2.163	1.45
81 by 108 in—do			1.20
Blankets, single length:			
All wool, 72 by 90 in—do		.122	.234
Cotton, 72 by 84 in—do	1.48	1.592	1.94
Bath towels, 20 by 40 in—do		1.966	4.29
Toweling:			
Cotton, 18 in. width—yard	5.1	3.795	
Part linen—do			3.17
Muslin, unbleached 36 in. width—do		4.537	
Curtains, kitchen—pair		1.359	3.27
Building materials, house:			
Lumber:			
Framing lumber 2 by 4 in.:			
Pine:			
No. 2 and better—1,000 bd. ft	.0207	.0228	.0509
Under No. 2—do	.0086	.00956	.0213
Fir:			
No. 2 and better—do	.0257	.0283	.110
Under No. 2—do	.0059	.00654	.0294
Boards, 1 in. random width, common:			
Rough:			
No. 2 and better—do	.0235	.0203	.0341
Under No. 2—do	.0165	.0143	.0209
Dressed, 1 in., S4S, random width, common:			
No. 2 and better—do		.00601	.0351
Under No. 2—do		.00648	.0100
Roofers, T and G, 1 by 6 in., No. 2 and better—do			.0168
Ship-lap, common pine:			
No. 2 and better—do	.0273	.0206	.0323
Under No. 2—do	.0204	.0154	.0203
Siding 6 in.:			
Drop (pat. 105–106):			
Pine:			
C and better—do		.00294	
Under C—do		.00348	
Fir:			
C and better—do		.00277	.00485
Under C—do		.00212	
Bevel (weatherboard):			
Pine:			
C and better—do	.0217	.00347	
Under C—do	.0175	.00281	
Cedar:			
Clear—do	.0097	.00156	.0102
B—do	.0042	.00067	
Flooring:			
Pine, yellow, 1 by 4 in.:			
B and B—do	.0145	.00884	.00566
Under B—do	.0097	.00594	

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Building materials, house—Continued			
Lumber—Continued			
Flooring—Continued	*Number*	*Number*	*Number*
Fir, V G, 1 by 4 in.:			
B and B—1,000 bd. ft.		.00694	
Under B—do		.00419	
Oak, 25/32 by 2¼ in.:			
Select—do			.0128
No. 1—do			.0147
Roofing:			
Shingles:			
Wood cedar, 16 in. No. 2—per square	.6570	.310	.112
Asphalt, MS., 3 in 1, 210–220 lb—do		.318	.968
Composition—100 sq. ft		.149	.554
Steel, galvanized, 28–29 gage—do		.0901	.198
Siding, asbestos shingle—square			.109
Millwork:			
Doors, interior 2 ft. 8 in. by 6 ft. 8 in. by 1⅜ in.:			
2 panel, fir—each	.1160	.0477	.247
Flush, hollow core—do	.0780	.0319	.260
Windows, house, check rail—unit	.2080	.145	.552
Kitchen cabinets—each			.121
Composition material:			
Insulating board, interior, ½ in—1,000 sq. ft		.00805	.0794
Gypsum board, ⅜ in—do	.0355	.0350	.0885
Plywood, interior, ¼ ad—100 sq. ft			.204
Brick:			
Common—per 1,000	.1	.0170	.0854
Face—do			.0237
Concrete blocks, 8 by 8 by 16 in—100		.0109	.201
Portland cement—94 lbs	1.0	1.620	5.42
Paint and paint supplies:			
Paint:			
Exterior, house—gallon	1.48	1.290	1.48
Interior, wall—do			1.56
Linseed oil—do		.252	
Nails, 8 d., common—pound	6.2	7.900	27.4
Screen wire 16 mesh 30 in. width—linear feet	4.4	2.180	4.31
Electric cable, indoor, 2 wire—100 ft			.808
Plumbing:			
Iron pipe, galvanized:			
1¼ in—linear feet			9.41
½ in—do			10.6
Fixtures:			
Mixing faucet, sink, chrome plate—each			.242
Kitchen sink, basin, single without fixtures—do			.173
Bathtub, 5 ft. enamel, iron, without fixtures—do			.0465
Toilet, water, china—do			.0627
Auto and auto supplies:			
Purchases and operations:			
Purchases:			
New automobiles, 4 door sedans:			
Total, 6 cylinder—each		.023	.00970
Total, 8 cylinder—do		.0214	.0325
Used automobiles—do			.0832
New ½ ton, pickup trucks—do			.00726
Used ½ ton, pickup trucks—do			.0118
Operation:			
Gasoline, filling station, regular—gallons		204.113	369.
Motor oil—do		5.500	7.23
Auto tires, 6.70 by 15—each		.465	1.07
Tubes, 6.70 by 15—do		.418	
Antifreeze, permanent—gallon			.848
Batteries, storage:			
45 plate—each		.0458	.275
51 plate—do		.0349	
Lubrication, Ford, Chevrolet, Plymouth—do			5.33

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Auto and auto supplies—Continued			
Purchases and operations—Continued	*Number*	*Number*	*Number*
Operation—Continued			
Motor tuneup, Ford, Chevrolet, Plymouth—each			5. 14
Spark plugs—do		. 1120	
Tire chains—pair		. 1010	
Feed:			
Grain:			
Corn—bushels	24. 0	16. 8	77. 5
Grain sorghum—100 lbs			4. 38
Wheat—bushels		2. 09	
Oats—do	7. 5	15. 8	51. 2
Barley—do		2. 53	8. 16
Hay:			
Alfalfa, baled—tons	. 8	. 44	1. 56
Other, baled—do		. 43	1. 19
Mixed feed:			
Poultry:			
Laying mash—100 lbs		7. 20	27. 5
Scratch grain—do		3. 34	3. 72
Chick starter mash—do		1. 92	5. 06
Broiler growing mash—do		4. 43	18. 7
Turkey growing mash—do			3. 08
Dairy:			
Under 29 percent protein—do		9. 80	
14 percent protein—do			3. 71
16 percent protein—do	4. 24		12. 9
18 percent protein—do			3. 83
20 percent protein—do			3. 03
24 percent protein—do			1. 39
Over 29 percent protein—do		2. 59	3. 92
Hog:			
14–18 percent protein—do			10. 2
Over 29 percent protein—do			6. 75
Beef cattle concentrate or supplement, 30 percent protein—do			7. 37
High-protein feeds:			
Soybean meal, all protein analysis—do		1. 16	
Soybean meal, 41 percent protein—do			2. 01
Cottonseed meal, all protein analysis—do	5. 1	4. 81	
Cottonseed meal, 41 percent protein—do			6. 04
Meatscrap—do	. 64	. 44	
Tankage—do		. 45	
Linseed meal—do	1. 2		
Grain byproducts:			
Bran—do	6. 6	3. 66	2. 06
Middling and gray shorts—do	6. 4	3. 35	2. 15
Cornmeal (for livestock feed)—do	4. 5	1. 08	2. 10
Mill run—do		. 82	
Corn gluten—do	1. 7	. 43	
Hominy feed—do		1. 60	
Stock salt—do	1. 5	4. 39	4. 78
Feeder livestock:			
Feeders and stockers:			
Cattle and calves—do		6. 26	13. 3
Lambs—do		. 77	. 707
Hogs—do		. 09	. 299
Dairy cattle (milk cows)—each		. 04	. 0205
Baby chicks, straight run—100		1. 224	4. 03
Turkey poults—100		. 04	16. 2
Motor supplies:			
Petroleum products:			
Gasoline:			
Filling station, regular—gallons		161. 00	338. 00
Tank truck, regular—do		68. 8	892. 0
Tractor fuel, diesel—do		72. 9	176. 0
Kerosene—do		9. 70	
Motor oil—do		8. 05	20. 2
Grease—pound cans		3. 61	35. 7

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Motor supplies—Continued	*Number*	*Number*	*Number*
Rubber products:			
Auto tires, 6:70 by 15—each		.392	.665
Inner tubes—do		.347	
Truck tires, 7:50 by 20, 8 ply—do		.043	.0996
Truck tires, 7:50 by 20, 10 ply—do		.052	.120
Tractor tires, 11–38—do			.124
Other supplies:			
Storage batteries, 45 plate—do		.057	.391
Storage batteries, 51 plate—do		.044	.161
Spark plugs—do		1.65	4.30
Antifreeze, permanent—gallons			1.90
Services:			
Lubrication, all makes—each			6.06
Motor tuneup, Ford, Chevrolet, Plymouth—do			6.81
Motor vehicles:			
Automobiles:			
New, 4-door sedans:			
6 cylinder—each	.010	.0091	.00633
8 cylinder—do	.009	.0107	.0212
Used—do			.0542
Pickups, ½ ton:			
New—do		.0116	.0204
Used—do			.0311
Trucks:			
New, 2-ton cab and chassis—do	.005	.0043	.00441
Used, 1½ to 2 ton—do			.0104
Tractors:			
Wheel:			
Under 20-belt hp—do	.00614	.0100	.00197
20–29-belt hp—do	.008652	.0190	.00479
30–39-belt hp—do			.0463
30-and-over belt hp—do	.004409	.0042	
Crawler:			
Under 25-drawbar hp—do		.00058	
25-34.9-drawbar hp—do		.00058	.000772
35–49.9-drawbar hp—do		.00059	.00102
Farm machinery:			
Plows:			
Moldboard:			
1-bottom—do		.0103	
2-bottom—do	.08004	.0391	.0377
3-bottom—do		.0061	.0133
Disk, 2-disk—do			.0103
Tillage implements:			
Cultivators:			
1 row—do			
2 row—do	.10467	.0353	.0227
4 row—do			.00433
Disk harrows:			
Offset, 7 ft—do			.00352
Single, 15 ft—do		.0071	.00688
Tandem:			
6 ft—do			.0160
7 ft—do	.0538	.0127	.0109
8 ft—do			.0145
1-way disk tillers—do			.00253
Spiketooth harrow, steel bar—do	.2724	.0494	.201
Springtooth harrow, 2 section—do	.05561		.0291
Planting and fertilizing machinery:			
Corn planter:			
2 row, with fertilizer attachment—do	.0546	.0131	.0221
4 row, with fertilizer attachment—do			.00441
Corn or cotton planter, 2 row—do	.02022		
Grain drills, tractor:			
13 tube fertilizer—do	.043	.0140	.0100
16 tube plain—do		.0066	.00962

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit		Quantity weight [2]		
		1924–29	1937–41	1955
Farm machinery—Continued				
Planting and fertilizing machinery—Continued		*Number*	*Number*	*Number*
Manure spreaders:				
All capacities	each	.05724		
70 bu. traction	do		.00328	.00405
95 bu. traction	do		.00357	.00442
95 bu. PTO	do		.00172	.00210
140 bu. PTO	do		.00214	.00265
Manure loader, tractor	do			.0109
Harvesting and processing machines:				
Combines, self-propelled:				
10 ft	do			.00217
12 ft	do		.00142	.00164
14 ft	do			.00150
Combines, tractor drawn:				
Auxiliary engine	do		.00259	.00523
PTO 5–6 ft	do	.057557	.0097	.00567
PTO 7–9 ft	do			.00174
Corn picker, husker:				
1 row	do			.00646
2 row	do		.0041	.00484
Cotton picker, 1-row:				
Self-propelled	do			.000254
Less tractor	do			.000258
Forage harvester:				
Pickup PTO	do		.00153	.00361
Row crop attachment	do	.0095247		
Row crop, auxiliary engine	do		.000612	.00296
Hay rakes, side delivery:				
All	do	.03333	.0072	
PTO	do			.01080
Traction operated	do			.00748
Mowers, tractor drawn or mounted:				
6 ft	do	.096		.0162
7 ft	do		.02447	.0190
Baler, hay, pickup, auxiliary engine	do	.00386	.00119	.0118
Hammer mill	do	.02866	.0133	.0144
Potato digger	do	.007737		
Dairy machines:				
Cream separators, 551–850 lb. capacity	do	.09728	.0193	
Milk coolers:				
Bulk	do			.00387
Side door, 6 can	do			.00234
Single milker unit	do		.0235	.0561
Stationary milker, pumper installed	do		.0116	
Farm wagons	do	.1833	.02064	.0695
Other farm machines:				
Electric motors ¼ hp	do		.0802	.124
Gas engines	do	.146254	.0243	.0324
Power sprayers	do		.0263	.0304
Grain elevator, portable, double chain:				
28 ft	do			.00718
34 ft	do			.00958
40 ft	do			.00505
Building materials:				
Framing lumber:				
Pine 2 by 4 in.:				
No. 2 and better	1,000 bd. ft	.0629	.0389	.0431
Under No. 2	do	.0264	.0163	
Fir 2 by 4 in.:				
No. 2 and better	do	.0780	.0482	.0574
Under No. 2	do	.0181	.0112	.0174
Boards:				
Rough:				
No. 2 and better	do	.0607	.0630	.0866
Under No. 2	do	.0427	.0443	.0604

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Building materials—Continued			
Boards—Continued	*Number*	*Number*	*Number*
Dressed:			
No. 2 and better—1,000 bd. ft		.0223	.0571
Under No. 2—do		.0240	.0615
Siding drop (pat. 105–106):			
Pine:			
C and better—do	.0214	.00826	.0100
Under No. 2—do	.0253	.00975	
Fir:			
C and better—do	.0201	.00775	.00779
Under No. 2—do	.0154	.00593	
Flooring, pine, yellow, B and B—do			.0148
Shiplap, common, pine:			
No. 2 and better—do	.0350	.0319	
Under No. 2—do	.0262	.0239	
Nails, 8d common—pounds	16.5	18.2	70.9
Paint and paint supplies:			
Paint:			
Exterior house—gallons	2.37	2.3	1.92
Interior, wall—do			.568
Linseed oil—do		.5	
Brick, common—1,000	.081	.06	
Cement, portland—94 lbs	3.0	3.86	10.1
Concrete blocks—100			.782
Roofing materials:			
Composition, 90 lb—square	.185	.738	1.33
Shingles:			
Asphalt—do		.0987	.828
Wood No. 2—do	3.68	.461	.173
Steel, galvanized 28 gage—do	.162	.595	2.07
Insulating board ½ in. interior—1,000 sq. ft			.0368
Barn sash—each	.85	.4	
Domestic water system jet type ½ hp. motor controls and tank—do			.0676
Iron pipe, galvanized 1¼ in—linear feet		11.0	13.8
Windmills—each	.01	.01	
Fencing materials:			
Wire:			
Barbed, galvanized 12½ gage:			
2 point—80 rods	.556	.695	.580
4 point—do		.595	.779
Woven wire fencing:			
Field and stock 32 in—rod		.565	.802
Poultry netting—150 ft	1.03	.396	
Posts:			
Steel—each	5.29	2.2	6.24
Wood—do	6.27	5.23	14.3
Gates, steel—do	.16	.15	
Boards, rough:			
No. 2 and better—1,000 bd. ft			.0270
Under No. 2—do			.0188
Farm supplies:			
Fuel and petroleum products:			
Gasoline, filling station—gallons	68.56		12.0
Kerosene—do	15.35		107.0
Range or furnace oil—do			25.4
Motor oil—do	5.234		
Soft coal (prepared sizes)—ton			.109
Pesticides:			
Arsenate of lead—pounds	5.15	14.8	4.65
Calcium arsenate—do		12.3	
DDT, wettable powder—do			95.3
Paris green—do		.7	
2,4-D—gallons			2.31

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Farm supplies—Continued	*Number*	*Number*	*Number*
Marketing containers:			
Fruit box, shook—boxes			5.48
Lug box, shook—do			4.74
Vegetable crate, shook—crates			6.35
New baskets, round stave, 1 bu. with cover—dozen	.964	4.98	2.06
New hampers, 1 bu. with cover—100			.209
New potato sacks (100 lb.)—do			.301
New bags, open mesh (approximate 50 lbs.)—do			.0484
Small handtools:			
Axes, with handle—each		.36	.354
Nail hammers, with handle—do		.26	1.05
Hoes, 7-in. blade—do	1.25	.55	.926
Pitchforks, 3 tine—do	1.25	.59	.452
Pitchforks, 4 tine—do		.19	.381
Scythes—do		.05	
Hand sprayers, pressure, 3–4 gal. capacity—do		.09	.142
Cordage:			
Baler twine—pounds			41.1
Binder twine—do	48.0	32.1	8.99
Rope, manila—do	14.7	5.06	3.02
Motors:			
Electric motors, ¼ hp—each			.268
Gas engines, 2.1–3.5 hp—do			.0813
Poultry equipment:			
Brooders, 450–550 chick capacity:			
Electric—do		.013	.0734
Gas—do			.0745
Oil—do		.027	.108
Dairy equipment:			
Farm milk cooler, side door—6 can			.00382
Milk pails, heavy, tin plated, 12 qt—each	.497	.74	2.47
Milk cans, 10 gal., standard weight—do	.5	.18	.190
Other equipment and supplies:			
Auto tires, 6.70 by 15—do	.346		
Barbed wire, 4 pt. galvanized, 12½ gage—spool, 80 rods			[3].602
Iron pipe, 1¼ in. diameter—linear feet	12.27		
Horse collars—each	.92	.407	
Muslin, 36 in. width, unbleached—yards			[4]12.8
Services:			
Electricity—kilowatts		157.0	1,420.0
Telephone, local—months			3.84
Farm magazines, annual subscription—number			3.44
First-class letter mail—letters			85.0
Fertilizer, mixed:			
0–14–14—ton			.0412
0–20–20—do		.027	.109
2–12–12—do		.024	.139
3–9–6—do		.037	.158
3–9–9—do		.030	.157
3–12–6—do		.017	.0673
3–12–12—do	.429	.105	.450
4–8–6—do		.020	.0791
4–8–8—do		.024	.0895
4–10–6—do		.031	.135
4–10–7—do		.033	.204
4–12–12—do		.022	.206
4–16–16—do		.042	.224
5–10–5—do		.050	.243
5–10–10—do	.213	.078	.446
5–20–20—do			.144
6–6–6—do		.0088	
6–8–4—do			.0393

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Fertilizer, mixed—Continued	*Number*	*Number*	*Number*
6–8–8 ton		.018	.175
6–10–4 do		.0085	
6–12–12 do		.011	.0895
8–8–8 do		.015	.0722
8–24–8 do		.007	
8–16–16 do			.0399
8–32–0 do		.004	
10–10–10 do		.042	.230
10–20–0 do		.007	
12–12–12 do			.0968
Fertilizer materials:			
Nitrogen:			
Anhydrous ammonia do		.016	.101
Ammonium nitrate do		.044	.258
Ammonium nitrate limestone mixture do		.019	.0826
Ammonium sulphate do			.110
Nitrate of soda do	.0564	.031	
Sodium nitrate do			.142
Sulphate of ammonia do	.0164	.022	
Phosphate:			
Ammonium phosphate do		.021	.0733
Phosphate rock do		.077	.195
Superphosphate, 18 percent do		.015	
Superphosphate, 20 percent do	.2228	.047	.159
Superphosphate, 42 percent do		.007	
Superphosphate, 45 percent do		.007	.0447
Potash: Muriate of potash (all quotes) do	.0079	.028	.0867
Secondary and trace elements:			
Gypsum (land plaster) do			.170
Lime and liming materials do	.321	1.342	
Ground limestone do			4.87
Seed:			
Field crops:			
Barley bushels		1.35	2.11
Corn, hybrid do		.827	2.56
Cottonseed 100 lb	.360		.682
Cowpeas bushels		.32	
Flax do			.541
Grain sorghum (open pollinated) 100 lb			1.28
Oats bushels		4.57	9.20
Peanuts 100 lb			.379
Potatoes, Irish do	.3	1.84	2.93
Rice do			.311
Rye bushels		.90	.677
Soybeans do		1.53	2.54
Wheat do		2.10	4.38
Hay and pasture:			
Alfalfa:			
Common 100 lb	.0983	.090	.0413
Certified:			
Northern and central zone do		.002	.239
Southern zone do		.008	
Clover:			
Alsike do		.03	.0291
Red do	.100	.09	.112
Ladino do			1.14
Sweet do	.080	.08	.0687
Korean lespedeza do		.12	.240
Kentucky bluegrass do	.030	.01	1.28
Ryegrass, common do		.02	11.0
Sudangrass do		.09	.101
Tall fescue (Alta-Ky. 31) do			.0881
Timothy do	.110	.11	.0746

See footnotes at end of table.

TABLE 7.—*Prices paid indexes: Quantity weights computed from weight base data for the pre-1950 index, the 1950, and the 1959 revisions*—Continued [1]

Item and unit	Quantity weight [2]		
	1924–29	1937–41	1955
Seed—Continued	*Number*	*Number*	*Number*
Cover crops:			
Austrian winter peas, 100 lb.		.05	
Hairy vetch, do.		.03	.0746

[1] Equivalent quantities purchased annually derived by dividing value of average annual purchases for item indicated, plus the imputed value of similar items not priced by the average price paid by farmers in the years shown.

[2] Purchases per farm family for family living items and per farm for production goods; quantities for 1924–29 and for 1937–41 differ from those carried in earlier publications where item specifications have changed, or changes in imputations have occurred due to variation in commodity price coverage.

[3] 14½-oz. cans.

[4] Includes one-half of the gasoline used for the automobile.

[5] Includes gasoline gallonage equivalent of expenditure for L.P. gas used in the household.

[6] Costs for rotary hoes and pulverizers imputed to this item.

[7] No price series available for baling wire; therefore the expenditure for it was imputed to barbed wire.

[8] No series available for tobacco canvas; therefore, the expenditure for it was imputed to muslin.

It has been customary in the past to make such substitutions as necessary from time to time, and this has continued in the recent revision. Such shifts are made without affecting the index as of the date of a change, by maintaining the aggregate involved at the same value as before the change. For example, instant coffee was added in March 1958, when this item first appeared on the food price inquiry. Previously, the weight for this item and for coffee substitutes as well, was assigned to bean or ground coffee, this being the only prices paid series available. Handled on this basis, the annual expenditures for coffee, instant coffee, and coffee substitutes would buy 45.6 pounds of bean or ground coffee in 1955. At March 1958 prices, this quantity cost $41.54.

The 1955 Food Consumption Survey indicated that expenditures for instant coffee amounted to approximately a seventh of the expenditures for bean and ground coffee, with the popularity of instant coffee continuing to increase since that time. Accordingly, 16 percent of the $41.54 annual expenditure or $6.67, was assigned to instant coffee in March 1958. Using the price of $1.24 per 6-ounce jar then current, the $6.67 allocation was equivalent to the cost of 5.38 jars of instant. This then became the "instant" quantity weight. Dividing the remaining expenditure ($41.54–$6.67) by the 91.1-cent price of ground or bean coffee provides the new quantity weight of 38.3 pounds presently used for this item. Table 8 summarizes the computations involved.

TABLE 8.—*Quantity weight revisions involved in the introduction of instant coffee series, March 1958*

Commodity and unit	Weight	Price per unit	Expenditure
	Units	*Dollars*	*Dollars*
From: Coffee, per pound	45.6	.911	41.54
To: Coffee, per pound	38.3	.911	34.87
Instant coffee, per 6-oz. jar	5.38	1.24	6.67
Total			41.54

It is important to note that the introduction of instant coffee prices made no change in the food index, at the time. Through imputation, 45.6 pounds of ground coffee contributed an expenditure of $41.54 to the food aggregate prior to the introduction of instant in March 1958. Upon its introduction, the cost of 38.3 pounds of ground coffee and 5.38 jars of instant coffee likewise added up to $41.54 on that date. Thereafter, fluctuations in the price of both instant and ground coffee determine the changes in the cost of coffee in computing the food index, whereas these changes were governed solely by the movement of ground coffee prices theretofore.

The necessity of the third point under the head of "Formula and Method of Computation" (p. 51) is obvious and does not require comment beyond the procedural steps already outlined as to method of imputation.

Link Date

The question of when the new weights should be given effect in the index was, of course, a crucial one. It will be recalled that the old weighting pattern was based upon surveys representing conditions at the beginning and at the end of the period 1937–41. There followed a severe World War with its numerous economic disturbances and dislocations, with a subsequent partial adjustment to peacetime and the later uneasy expansion during the Korean affair. It seems very doubtful that the 1937–41 weighting pattern really continued to represent farm purchase patterns during all these disturbing times.

There is a clear indication, of course, that by 1955 the pattern of farmers' expenditures had changed very materially (table 1). On the other hand, there is much evidence to indicate that 1955 conditions began to exist during, or immediately after, World War II. A study of the relations displayed by the two major components of the index, namely, prices paid for commodities bought for living and prices paid for commodities bought for production, shows that these two indexes followed a generally similar course from the middle 1930's until 1952, but that after 1952 they diverged very sharply. The production group of commodities dropped sharply during the next year or so and has since remained at a considerably lower level than the living group, which remained at about the 1952 level for some years. Recently, both groups have moved upward, but the living group has remained at the higher level.

The expenditure survey was made in early 1956 and related to the year 1955. This year was characteristic of the period after the production group of commodities had fallen below the living group. Moreover, post-Korean adjustments had largely been worked out by then. Consequently, it was concluded that the 1955 weights were representative of conditions from about 1952 forward, or at any rate that they were more representative of conditions from 1952 forward than were the 1937–41 weights; therefore, the new weights were made effective in 1952, that is, the new index was linked to the old index in 1952, the particular month of September being selected since this was the date that the group indexes for farm family living and for production goods were at the same level.

As of December 1958, the revised index was 295 as compared to 308 for the unrevised index, or 4.2 percent lower.

The Index of Prices Received by Farmers

The 1959 revision of the Index of Prices Received by Farmers also maintains the same general pattern as that of the 1950 revision. The principal changes accomplished in the revision were:

1. Revision of weights.
2. Linkage of the new index to the old as of September 1952.
3. Revision of weighting and pricing system for vegetables and for noncitrus fruit.

As in the case of the Parity Index, the revised Index of Prices Received by Farmers retains the same major commodity groups and general structure as the previous index (*6*). Shifts in commodity coverage were inconsequential as indicated later.

Basis for Weights in the 1959 Revision

The basic data for determining the weighting pattern for the Index of Prices Received by Farmers derive from the official estimates of production, marketing, and sales of farm products which result from the regular data collecting procedures of the Department. In this respect, the situation is different from that of the Parity Index, in which case, though price data are collected currently, quantity data, particularly for living expenditures, are for the most part available only at intervals, usually as a result of a special survey.

In choosing a representative period of marketings and prices for farm products, no year or average of years is entirely free of all "abnormalities." It was desirable to have the weighting pattern represent current conditions of marketings and prices, and in this respect the average for the period 1953–57 seemed quite suitable. This period included some years in which crop and livestock production was curtailed by drought and some years which were very favorable for both crop and livestock production. The effect of war-inflated prices was not especially important during this period. A further consideration in choosing the 1953–57 weight base period was the fact

that it centered on 1955—the year for which weights were available for the revised index of prices paid by farmers.

Perhaps the most significant change in the weighting pattern is an improvement in handling fruit and commercial vegetables.

More particularly, in the index as computed prior to the January 1959 revision, for commercial vegetables and for the noncitrus fruits, quantity weights and prices represented only that portion sold for fresh market. However, in computing the percentage weights for combining these indexes into the all-crops index, the value of all sales (fresh and processing) was included. In the revised index, quantity weights represent total marketing (fresh and processing). Monthly prices represent a weighted average computed by applying the 5-year average percent sold fresh to the current fresh market price and the comparable 5-year average percent sold for processing applied to the current season average price for sales for processing. This procedure provides a means of reflecting both the fresh and processing portions of these crops and by so doing tends to reduce the seasonal variation in these indexes.

Selection of Commodities

As a general rule, all commodities were included in the index if suitable price and marketing data were available and if the average value of marketings during the 5 years 1953–57 represented 1 percent or more of the total value of commodities in the subgroup index. There are 12 subgroup indexes. As a result of this review, the revised coverage included 55 comodities representing about 93 percent of the total value of marketings in the years 1953–57. In effect, only two commodities were added—green peas for processing and asparagus. A third commodity—tangerines—had formerly been included in combination with oranges, but was continued as a separate commodity.

Handling Short Marketing Season Items

Current monthly price estimates for most commodities in the index are available. For some index items, however, the crop moves within a relatively short season. These present special problems of technique, and require consideration of price measurement both with respect to changes between years and within years. Such crops sometimes present individual problems, and the method of handling seeks to resolve such problems as far as possible, recognizing that no method is likely to be fully satisfactory.

Tobacco is one such special crop, comprising a wide variety of types with widely varying marketing periods. The price used in the index each month is an average of the current prices for the types being sold currently, and the most recent season average prices for types not being currently marketed, the price for each type being weighted by estimated production.

In the case of peaches, pears, strawberries, asparagus, cantaloups, and watermelons the price for the last month of the season's marketing is used each month until the new crop starts to market. For most of these crops the interval in which there are no sales is relatively short, and it was decided to use the price in the last month of active marketing rather than the season average price during the months of no sale. The use of the season average during the months of no sales would generally result in an index adjustment in the month following the end of the marketing season and another in the month when the new crop started marketing. The present procedure requires an adjustment only at the beginning of the crop season.

Formula and Computation

The formula of the Index of Prices Received by Farmers is similar to that of the Index of Prices Paid, Interest, Taxes, and Wage Rates. Also the general method of computation is similar. The Index of Prices Received however, has a broader weight-base period, 1953–57 instead of 1955.

Average marketings multiplied by average prices for the 1953–57 weight base period provide base aggregates (price×quantity). Similar aggregates were computed for each month, using 1953–57 average marketings and current monthly prices. The current monthly group aggregate divided by the 5-year average aggregate yields the monthly index on the base 1953–57=100.

In the tabulation at the top of page 73, for purposes of illustration, are the price and marketing data for the food grains index.

Commodity	Unit	Average quantity sold 1953–57	Average price 1953–57	Average aggregate 1953–57	Average price January 1959	Aggregate January 1959
		(1)	(2)	(3) (1)×(2)	(4)	(5) (1)×(4)
		Millions	*Dollars*		*Dollars*	
Wheat	Bushel	913	2.00	1,826.0	1.71	1,561.2
Rye	do	17	1.12	19.0	.967	16.4
Rice	Hundredweight	52	4.93	256.4	4.85	252.2
Food grains aggregate				2,101.4		1,829.8

Index, January 1959 (1953–57=100) $=\frac{1,829.8}{2,101.4}=87.1$.

The monthly group indexes so computed are combined into an all crops index (eight subgroups) and an all livestock and livestock products index (four subgroups), using percentage weights derived from average value of marketings during the period 1953–57. Group percentage weights were computed using income from marketings, including, as appropriate, income from commodities not included in the index.

For example, the food grains index includes only wheat, rye, and rice but in computing the percentage weight for this subgroup index the income from buckwheat was added to that of the three commodities included in the index. A similar procedure, as appropriate, was used for each of the subgroups. These weights were used to combine the several crop subgroup indexes into an all crops index on the base 1953–57=100. A similar procedure was used to compute the livestock and livestock products and the all commodity index. The income from marketing data, and the derived weights are shown in table 9. Quantity weights are presented in table 10.

The revised weights (1953–57), as compared with 1937–41, give relatively greater importance to the crops index and correspondingly decreased importance to the livestock and livestock products index. The effect of this change is that with the crops index declining at a relatively greater rate than the livestock and products index since the September 1952 link date, and with the increased weight given the crops index, the all commodities index on the revised basis was 0.8 percent below the unrevised index as of December 1958. These revisions had the effect of reducing the 1949–58 10-year average index of prices received by farmers, as adjusted to include an allowance for unredeemed loans and other supplemental payments, from 258 to 256. This had the effect of increasing adjusted base prices 0.8 percent as of January 1959.

As previously noted, the revised Index of Prices Paid, Including Interest, Taxes, and Farm Wage Rates, was 4.2 percent below the unrevised index. The net result was to lower parity prices of commodities on the modernized formula about 3.4 percent.

Link Date

With the decision to link the Parity Index in September 1952 it appeared desirable to link the Prices Received Index as of the same date so as to maintain the parallel structure of the two indexes. This presented a small technical problem in that the Crop and Livestock components of the revised index were at somewhat different levels. This required a slight modification in the linking factor for the Crop and Livestock Components to insure that their range would always include the total index. The adjustment in the link factors for the Crop and Livestock Components was about a tenth of 1 percent. The total index computed on a 1953–57 base is linked directly to the previous index so as to relate the change since 1952 to the change as indicated by the combined Index and thus maintains precisely the formula indicated on page 58.[4]

[4] With, of course q_{53-57} instead of q_{58} representing quantity weights.

TABLE 9.—*Group weights for index of prices received by farmers* [1]

Commodity group	1924–29 weights			1937–41 weights			1953–57 weights		
	Average cash receipts	Percent weights of—		Average cash receipts	Percent weights of—		Average cash receipts	Percent weights of—	
		Groups	Total		Groups	Total		Groups	Total
	Thousand dollars	*Percent*	*Percent*	*Thousand dollars*	*Percent*	*Percent*	*Thousand dollars*	*Percent*	*Percent*
Crops:									
Food grains	885, 705	18. 6	8. 9	551, 935	16. 6	7. 0	2, 161, 788	17. 5	7. 9
Feed grains and hay	742, 830	15. 6	7. 5	526, 683	15. 9	6. 7	2, 488, 492	20. 1	9. 1
Cotton	1, 370, 443	28. 9	13. 9	654, 504	19. 7	8. 3	2, 282, 890	18. 5	8. 4
Tobacco	255, 171	5. 4	2. 6	290, 254	8. 8	3. 7	1, 121, 863	9. 1	4. 1
Oil-bearing crops	233, 619	4. 9	2. 3	237, 943	7. 2	3. 1	1, 335, 961	10. 8	4. 9
Fruit	595, 722	12. 5	6. 0	456, 339	13. 8	5. 8	1, 296, 471	10. 5	4. 7
Commercial vegetables	345, 674	7. 3	3. 5	376, 764	11. 4	4. 8	1, 137, 337	9. 2	4. 2
Other vegetables	322, 188	6. 8	3. 3	217, 993	6. 6	2. 8	530, 587	4. 3	1. 9
Total crop subgroups	4, 751, 352	100. 0	-------	3, 312, 415	100. 0	-------	12, 355, 389	100. 0	-------
Other crops	441, 351	-------	-------	387, 412	-------	-------	1, 275, 590	-------	-------
Total crops	5, 192, 703	-------	48. 0	3, 699, 827	-------	42. 2	13, 630, 979	-------	45. 2
Livestock and products:									
Meat animals	2, 801, 103	50. 2	26. 1	2, 487, 043	49. 6	28. 6	8, 688, 741	53. 0	29. 1
Dairy products	1, 627, 643	29. 1	15. 1	1, 535, 881	30. 6	17. 7	4, 373, 259	26. 7	14. 6
Poultry and eggs	1, 060, 591	19. 0	9. 9	881, 886	17. 6	10. 2	3, 204, 531	19. 5	10. 7
Wool	96, 555	1. 7	. 9	110, 655	2. 2	1. 3	132, 966	. 8	. 4
Total livestock and products subgroups	5, 585, 892	100. 0	-------	5, 015, 465	100. 0	-------	16, 399, 497	100. 0	-------
Other livestock and products	39, 791	-------	-------	44, 417	-------	-------	156, 044	-------	-------
Total livestock and products	5, 625, 683	-------	52. 0	5, 059, 882	-------	57 8	16, 555, 541	-------	54. 8
All farm products	10, 818, 386	-------	100. 0	8, 759, 709	-------	100. 0	30, 186, 520	-------	100. 0

[1] For combining the various subgroup indexes into an all-crop, an all-livestock and livestock products, and an all-commodity index, weights are percentages based on average cash receipts received by farmers for the 3 periods 1924–29, 1937–41, and 1953–57.

TABLE 10.—*Index of prices received by farmers: Annual average quantity of each commodity sold during weight base periods* [1]

Commodity		1924–29	1937–41	1953–57
		Millions	*Millions*	*Millions*
Wheat	bushels	692	677	913
Rye	do	33	24	17
Rice [2]	hundredweight	16	22	52
Corn	bushels	487	550	1, 134
Oats	do	301	198	349
Barley	do	85	114	241
Sorghum grain	hundredweight	----------	13	115
Hay	tons	12	10	15
All cotton	pounds	7, 498	----------	----------
American upland cotton	do	----------	6, 585	6, 887
American Egyptian cotton	do	----------	16	27
Tobacco [3]	do	----------	----------	----------
Cottonseed	tons	5	5	5
Peanuts	pounds	674	1, 234	1, 404
Soybeans	bushels	----------	65	366
Flaxseed	do	21	19	37
Apples [4]	do	129. 0	83. 1	103
Tangerines [5]	boxes	----------	----------	4
Oranges	do	38. 2	71. 6	125
Grapefruit	do	9. 8	35. 7	44
Lemons	do	6. 5	11. 3	15
Pears [4]	bushels	18. 0	16. 2	29
Peaches [4]	do	43. 9	34. 4	58
Strawberries	pounds	418	475	480
Grapes	tons	. 8	----------	----------

See footnotes at end of table.

TABLE 10.—*Index of prices received by farmers: Annual average quantity of each commodity sold during weight base periods* [1]—Continued

Commodity		1924–29	1937–41	1953–57
		Millions	*Millions*	*Millions*
Asparagus	hundredweight			3.4
Beans, snap [4]	do	2.1	6.2	11.8
Cabbage [4]	do	18.0	24.0	24.4
Carrots [5]	do	3.0	10.3	15.0
Cauliflower [6]	do	1.8	4.1	4.8
Celery	do	3.4	10.9	14.8
Onions	do	12.4	17.1	23.1
Lettuce	do	11.3	16.9	32.7
Sweet corn [4]	do		7.9	42.5
Broccoli [6]	do		1.0	2.1
Cucumbers [4]	do		3.0	10.6
Cantaloups	do		11.3	12.7
Watermelons	do		22.5	31.2
Peppers, green	do	.8	2.4	3.2
Spinach [4]	do	2.1	3.6	4.4
Tomatoes [4]	do	8.9	17.0	88.8
Green peas [7]	do	1.2	2.8	9.7
Potatoes	do	140	145	196
Sweet potatoes	do	13	14	10
Beans, dry edible	do	9	15	16
Cattle	do	153	157	288
Calves	do	16	18	40
Sheep	do	3	5	3
Lambs	do	15	20	16
Hogs	do	126	121	172
Milk, wholesale	do	288	452	914
Milk, retail	quarts	3,018	2,910	1,265
Butterfat, in cream	pounds	1,359	1,309	539
Chickens	do	1,563	1,815	4,993
Eggs	dozen	2,390	2,548	4,494
Turkeys	pounds		436	1,163
Wool [3]	do			

[1] Quantities used for weighting monthly prices during the period for which weight base is effective—1924–29 weights effective January 1910–December 1934; 1937–41 weights effective January 1935 through August 1952; 1953–57 weights effective September 1952 to date.

[2] Louisiana only 1924–29. United States 1937–41 and 1953–57.

[3] Price relative with 1910–14 base used for computation of index.

[4] 1924–29 and 1937–41 fresh use. 1953–57 fresh and processing.

[5] Included with oranges in 1924–29 and 1937–41.

[6] 1924–29 fresh use; 1937–41 and 1953–57 fresh and processing.

[7] 1924–29 and 1937–41 fresh use. 1953–57 processing.

Areas in Need of Additional Price Coverage

The Index of Prices Received is based on price series representing about 93 percent of receipts from sale of farm products. Of the approximately 7 percent of cash receipts from commodities not specifically covered, livestock and products accounted for nearly 1 percent, and crops for about 6 percent. Within the crops group the most important commodities not covered are the forest, nursery, and greenhouse products which represent nearly 3 percent of total sales or 21 percent of the crop items not covered. Although fragmentary data regarding marketings and prices are available for these products they are not adequate for index purposes.

Fruit and nut crops, accounting for between 1 and 2 percent of total sales, represent the group of next importance not specifically included in the index. Within this group grape crops are the most important—accounting for nearly a third of the fruit and nut crops not specifically covered. Monthly price data are not available for these crops. Sugar beets, which accounted for just under half of 1 percent of total sales, were the only other single crop of importance not included. Again, monthly price data are not available. In the case of livestock and products there was no single commodity of any significance not included in the index.

It has already been observed that for some areas of farm expenditures it has never been possible to collect the price information necessary to have

all important farm costs represented directly in the index. As a consequence, these price areas have for many years been imputed more or less directly to commodity price series actually in the index. Thus, medical, dental, and hospital expenditures have never been represented by price data. In both the 1950 and 1959 revisions at any rate, the weight of these expenditures was imputed to the Living Index generally. However, medical, dental, and hospital expenses amounted to about 7.4 percent of all living expenditures in 1955; personal insurance amounted to 2.6 percent; recreation to 2.1 percent. These are the areas of family living that are in greatest need of being covered by specific price series.

Machine hire and custom work amounted to 2.8 percent of all production expenditures in 1955; marketing expenses for crops and livestock, 2.5 percent; cash rent and irrigation, 2.6 percent; insurance, about 0.8 percent.

None of the above have ever been represented by price series, since the collection of the necessary price data has not been possible. The filling of these blindspots would comprise the greatest single improvement in the Parity Index. There are, in addition, several areas within existing index commodity groups that are in need of additional price series. These include fuel (notably L.P. gas), marketing containers, insecticides and pesticides, and machinery repair and maintenance in the prices paid index. Forest products (veneer logs, posts, stumpage, ties) and floral, nursery, and greenhouse products are the chief items missing from a complete accounting for the price factor of farm income. These needs have been set forth previously (*16*).

In Conclusion

The revised indexes, together with the ones they replace, are presented in table 11, on an annual basis, and the revised indexes, monthly, insofar as available, 1910 to the present, in tables 12 and 13. Figure 2 presents the revised indexes, together with the Parity Ratio, over the span of a half century—lacking 2 years.

It is believed that the 1959 revisions of the Index of Prices Received by Farmers and the Parity Index achieve distinctly improved measures of the major price relationships affecting agriculture.

The Parity Index, in particular, had become biased upward as a result of the use of old 1937–41 weights beyond the period for which they were representative. It is unfortunate, therefore, that the necessary surveys to update the index could not have been made earlier so that the interval between weight-base periods might not have been so long as from 1941 to 1955.

In any event, for the first time in a quarter of a century the Parity Index now is computed with contemporary weights. It is to be hoped that in the future, the intervals between weight bases may be shorter, and that the weighting patterns for both indexes may be kept more nearly current than in the past.

One further point may be mentioned. The two indexes are the only major indexes prepared by the Federal Government for which the base period is nearly a half century in the past. Rather clearly, the numerous dynamic drives in American life and changing economic organization complicate the making of price or other comparisons over any such period with a high degree of precision. Many products now used widely throughout agriculture were just beginning to be thought of in 1910–14. Similarly, products then in common use are now little more than museum pieces. Means for collecting statistics were far less developed then than now, and data of nearly all kinds were far more scarce.

Methods of marketing have changed, pricing points and procedures have shifted, and the structure of production and marketing has changed. Technology has brought profound changes into every aspect of agriculture, as in every other phase of American life. In fact, few aspects of life either in the city or country are more than roughly comparable with their counterparts a half century earlier.

All these changes have laid a heavy burden upon index numbers which have for their object the measurement of price changes over long periods. Accordingly, from the point of view of techniques of price measurement, an updating not only of the weight pattern of these indexes, but of the reference point as well, would simplify considerably the problem of price measurement in the future.

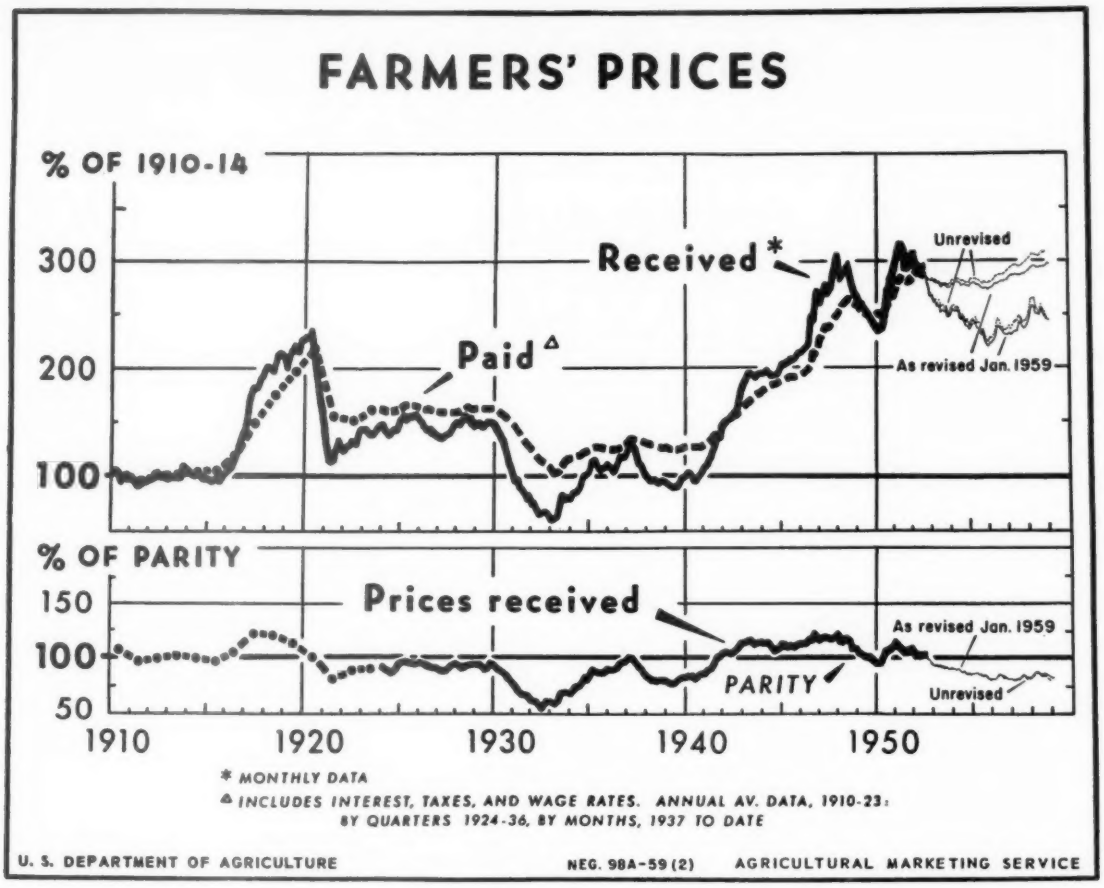

Figure 2

TABLE 11.—*Index of prices received and prices paid, interest, taxes, and wage rates, and the parity ratio revised and unrevised, 1952–58, annual averages*

Year	Prices received		Prices paid, interest, taxes, and wage rates		Parity ratio	
	Revised	Unrevised	Revised	Unrevised	Revised	Unrevised
1952	288	288	287	287	100	100
1953	255	258	277	279	92	92
1954	246	249	277	281	89	89
1955	232	236	276	281	84	84
1956	230	235	278	285	83	82
1957	235	242	286	295	82	82
1958	250	255	293	305	85	84

TABLE 12.—*Index numbers of prices received by farmers, United States, by months, 1910–59*

ALL FARM PRODUCTS

[1910–14=100]

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Average
1910	107	105	107	106	104	104	102	100	103	102	101	101	104
1911	100	97	94	92	92	93	95	95	95	93	93	95	94
1912	96	97	98	102	103	101	99	98	98	100	98	98	99
1913	97	98	99	99	98	100	100	101	105	108	108	106	102
1914	105	105	104	103	103	102	102	101	100	97	97	98	101
1915	99	99	97	99	101	99	97	95	97	102	102	102	99
1916	105	107	108	109	110	111	113	119	127	133	141	142	119
1917	143	150	156	173	183	185	184	185	188	194	194	197	178
1918	201	204	202	202	201	198	202	209	217	215	211	213	206
1919	209	200	203	213	220	220	227	227	217	219	227	227	217
1920	229	229	229	235	236	233	227	211	201	187	168	148	211
1921	141	129	127	118	114	112	116	121	125	131	129	126	124
1922	119	127	129	128	133	134	132	127	127	133	139	143	131
1923	143	143	143	144	141	139	136	134	141	144	147	147	142
1924	147	145	138	140	138	136	138	146	140	147	147	151	143
1925	157	155	159	155	154	157	159	159	153	156	156	155	156
1926	154	154	149	151	149	146	141	140	143	139	140	138	145
1927	137	137	134	134	136	137	136	140	148	149	149	149	140
1928	148	145	147	150	155	150	151	145	149	148	146	148	148
1929	145	148	148	147	144	145	150	151	149	149	147	147	148
1930	145	141	136	137	133	128	117	115	119	114	110	104	125
1931	100	95	97	97	90	85	84	82	80	76	80	76	87
1932	71	68	70	68	63	59	63	65	66	63	63	62	65
1933	59	54	56	60	70	71	83	78	78	78	80	77	70
1934	76	83	84	82	82	84	86	95	101	100	101	101	90
1935	108	112	112	114	111	106	104	105	106	108	108	113	109
1936	109	111	107	108	107	109	115	121	121	119	119	123	114
1937	127	128	132	132	130	125	126	122	119	113	109	107	122
1938	104	99	99	97	95	95	97	93	95	94	96	99	97
1939	96	95	95	94	93	91	91	90	99	99	100	99	95
1940	101	104	103	103	101	96	97	95	98	100	102	104	100
1941	108	107	108	114	115	120	126	130	139	137	136	142	124
1942	148	150	151	154	154	154	156	160	164	168	170	176	159
1943 [1]	183	187	194	196	194	194	192	193	194	197	196	199	193
1944 [1]	201	198	200	199	198	196	193	192	195	195	197	202	197
1945 [1]	206	203	205	208	205	209	208	206	202	206	210	213	207
1946 [1]	214	213	215	217	218	222	243	248	244	271	263	262	236
1947	256	260	279	273	267	265	271	274	286	287	289	304	276
1948	310	283	286	292	290	294	297	290	289	274	269	268	287
1949	267	257	262	258	255	249	244	243	248	242	237	237	250
1950	235	239	241	245	250	249	261	267	274	268	276	289	258
1951	301	313	311	312	306	300	294	291	292	297	303	306	302
1952 [2]	299	293	291	292	291	290	292	294	288	280	275	267	288
1953 [2]	266	261	261	257	259	251	254	251	253	246	246	250	255
1954 [2]	254	254	252	253	252	244	243	246	242	237	237	234	246
1955 [2]	238	240	240	241	236	235	232	229	231	227	222	219	232
1956 [2]	222	222	224	229	235	238	237	234	233	230	229	229	230
1957 [2]	231	229	230	232	233	233	239	242	240	236	235	237	235
1958 [3]	241	245	257	257	256	250	250	248	255	249	247	244	250
1959 [3]	245	243	244	244	245	242	------	------	------	------	------	------	------

[1] Average per unit production payments made on butterfat, milk, beef cattle, sheep, and lambs are included for period October 1943–June 1946 inclusive.

[2] Revised January 1959.

[3] Revised May 1959.

TABLE 13.—*Index numbers of prices paid by farmers for commodities, interest, taxes, and wage rates, United States, 1910–59* [1]

[1910-14=100]

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average
1910													97
1911													98
1912													101
1913													101
1914													103
1915													105
1916													116
1917													148
1918													173
1919													197
1920													214
1921													155
1922													151
1923			158			159			160			159	159
1924			160			159			160			161	160
1925			165			164			163			162	164
1926			161			162			160			159	160
1927			159			159			159			159	159
1928			162			164			162			161	162
1929			162			161			160			159	160
1930			157			154			150			144	151
1931			138			132			126			122	130
1932			117			112			110			107	112
1933			102			105			115			115	109
1934			118			118			122			123	120
1935			125			125			123			123	124
1936			122			122			126			127	124
1937	129	130	132	133	134	133	133	132	130	129	128	127	131
1938	127	127	126	125	125	125	124	123	122	122	122	123	124
1939	123	123	122	123	123	122	122	121	123	123	123	123	123
1940	124	124	125	125	125	123	123	123	123	123	124	124	124
1941	126	126	126	128	129	130	133	135	137	139	140	142	133
1942	144	146	148	150	151	152	153	154	154	157	158	159	152
1943	162	164	166	169	171	172	172	173	172	175	175	177	171
1944	178	180	180	182	182	182	183	183	183	184	184	185	182
1945	187	188	188	190	190	190	190	190	190	191	191	192	190
1946	194	195	196	198	200	203	211	214	213	220	225	224	208
1947	227	229	234	237	237	238	240	242	245	247	249	253	240
1948	262	257	258	261	262	263	263	261	260	258	258	257	260
1949	256	253	256	255	254	253	251	249	249	247	246	247	251
1950	249	249	250	251	254	255	257	258	261	262	264	266	256
1951	273	277	281	284	284	283	283	283	283	284	285	285	282
1952	288	289	289	290	290	288	287	288	286	283	282	281	287
1953	282	280	279	278	278	274	276	277	275	274	274	275	277
1954	278	278	279	279	280	278	276	277	277	276	276	275	277
1955	278	278	279	278	277	277	275	274	273	274	274	272	276
1956	274	274	275	277	278	278	279	280	280	280	281	281	278
1957	284	285	286	286	287	286	286	286	286	287	287	288	286
1958	290	291	293	294	295	294	293	293	294	294	294	295	293
1959	298	297	298	299	299	298							

[1] The Parity Index, as revised January 1959.

Literature Cited

(*1*) Black, John David, and Mudgett, Bruce D.
1938. INDEX NUMBERS. Social Science Research Council. Scope and Method Series. Bull. 10:35–39.

(*2*) Clayton, C. F.
1926. INDEX NUMBERS OF THE PRICES OF FARM PRODUCTS. Journal of Farm Economics. 8:347–355.

(*3*) Fisher, Irving
1922. THE MAKING OF INDEX NUMBERS. Boston, Houghton-Mifflin.

(*4*) Mudgett, B. D.
1951. INDEX NUMBERS. John Wiley & Sons, Inc., New York.

(*5*) Persons, Warren M.
THE CONSTRUCTION OF INDEX NUMBERS.

(*6*) Stauber, B. R., Koffsky, N. M., and Randall, C. Kyle
1950. THE REVISED PRICE INDEXES. Agricultural Economic Research. Vol. II, No. 2.

(*7*) U.S. Congress
1959. DEPARTMENT OF AGRICULTURE APPROPRIATIONS FOR 1960. Hearings before the Subcommittee on appropriations, House of Representatives, 86th Congress, 1st sess, Part 1.

(*8*) U.S. Agricultural Marketing Service
AGRICULTURAL PRICES. January 1954.

(*9*) U.S. Agricultural Marketing Service and U.S. Agricultural Research Service
1956. FOOD CONSUMPTION OF HOUSEHOLDS IN THE UNITED STATES

(*10*) U.S. Bureau of Agricultural Economics
1928. INDEX NUMBERS OF PRICES FARMERS PAY FOR COMMODITIES PURCHASED, 1910–28. 24 pp. Washington, D.C. (Processed.)

(*11*) U.S. Bureau of Agricultural Economics
1933. INDEX NUMBERS OF PRICES FARMERS PAY FOR COMMODITIES PURCHASED 1910–32. 9 pp. Washington, D.C. (Processed.)

(*12*) U.S. Bureau of Agricultural Economics
1934. INDEX NUMBERS OF PRICES, WAGE RATES, TAXES, AND INTEREST PAYABLE BY FARMERS, 1910–34. 5 pp. chart. Washington, D.C. (Processed.)

(*13*) U.S. Bureau of Agricultural Economics
1934–35. INDEX NUMBERS OF PRICES RECEIVED BY FARMERS FOR FARM PRODUCTS, 1910–35. (Processed.)

(*14*) U.S. Bureau of Agricultural Economics
1935. INDEX NUMBERS OF PRICES PAID BY FARMERS FOR COMMODITIES 1910-35. 28 pp. Washington, D.C. (Processed.)

(*15*) U.S. Bureau of Agricultural Economics
1944 and 1949, INDEX OF PRICES RECEIVED BY FARMERS, 1910–48 (DATA ADDED IN 1949.) (Processed.)

(*16*) U.S. Department of Agriculture
1957. AGRICULTURAL PRICES AND PARITY. Agricultural Handbook 118. Major Statistical Series of the U.S.D.A., Vol. I.

(*17*) U.S. Department of Agriculture
1921. PRICES OF FARM PRODUCTS IN THE UNITED STATES. U.S. Department of Agriculture Bull. 999.

(*18*) U.S. Department of Agriculture and U.S. Department of Commerce
1956. FARMERS' EXPENDITURES FOR FARM LIVING AND PRODUCTION. Vol. III, pt. II, 1954. Census of Agriculture.

(*19*) U.S. Department of Agriculture and U.S. Department of Commerce
1958. FARMERS' EXPENDITURES BY REGIONS. U.S.D.A. Statistical Bulletin No. 224.

A New Technique for Estimating Forest-Land Areas by Ownership Class

By R. O. McMahon

Ownership of forest land has been the subject of continuing research in the United States since about 1940, because knowledge of who owns this land, why it is owned, and what is being done with it is essential to development of appropriate forest-land management policies and programs. The accompanying list of selected references furnishes evidence of previous work in forest-land ownership research. Despite interest in this field, however, procedures used in these studies have shown surprisingly little variation. The study reported here, which is directly concerned with ownership of private forest land in Lane County, Oreg., represents a different approach. Specifically, it develops a new method for classifying private owners in the county and in other areas where similar basic data are available. This method may also have application in other regions.

AS CONCERN WITH EXTENT and quality of forest-land management became more widespread, research workers began to realize the need for knowledge about individual forest owners—who they were, what they did, why they owned forest land, how much they owned, and how and when they acquired it. Thus, an initial need was for intensive survey to identify and classify owners of forest lands, as illustrated by (*2*) and (*15*).[1]

But this knowledge about the owner's identity and characteristics did not shed a great deal of light on the extent and quality of management, so the next step was in the direction of intensive studies designed to relate ownership characteristics to forest management intentions and practices (*3*, *4*, *12*, *13*, *14*, and *16*).

More recently, the approach to forest-land ownership research has been from a different direction. Intensive studies such as those referred to above are significant but a growing need has developed for extensive surveys, which would gather much the same type of data but would cover large areas with less expense and time-consuming effort and would be designed to provide information on which land-management policies and programs can be based. Typical of this approach are current studies in California, begun in the mid-1940's on a county basis and later expanded to a subregion basis (*1*, *5*, *9*, *10*, *11*). Although these studies have not correlated ownership characteristics with management practices as yet, it is expected that they will be extended to do so in the future.

Other studies falling in this group have analyzed management practices (*7*, *18*, *20*). In addition, the U.S. Forest Service's reappraisal report of 1946, and its 1958 report, "Timber Resources for America's Future," were even more extensive; they covered the entire Nation. The reappraisal report related cutting practices and fire protection to type of forest owner, whereas the 1958 report (TRAF) classified recently cut areas by ownership on the basis of productivity status following cutting.

As to techniques, the studies show how objectives influenced the choice of procedures. The intensive type of survey was concerned with a relatively small area—parts of one or several counties;[2] hence, data were gathered directly from individual landowners, and statistical sampling designs were not employed. In effect, the entire universe was interviewed. Furthermore, the research workers were concerned with conditions in a given area; they had no intention of generalizing results for application to a wider area. With extensive surveys, on the other hand, a much larger area was involved, and time and funds prohibited a 100-percent canvass. Statistical sampling designs were therefore used, and these designs also permitted measuring the accuracy and reliability of results.

Only two types of sampling designs have been used in these extensive surveys. An article by

[1] Italic numbers in parentheses refer to Literature Cited.

[2] The projects reported in (*13*) and (*14*) are slight exceptions. Each covered an area of approximately 8 million acres, involving 15 and 14 counties, respectively.

James (*6*) discusses the two methods, area and line transect, but concentrates on the advantages and usefulness of the former. Hasel and Poli (*5*) and Poli (*8*) describe in detail the line transect procedure. This article offers a new point-sampling technique for conducting extensive surveys of forest-land ownership patterns.

Description of Technique

The present technique was developed [3] and used in conjunction with a comprehensive analysis of the forest resources and economy of Lane County, Oreg. (*17*). Details of this technique were considered to be of sufficient interest to merit separate publication.

For the last 25 years, the Forest Survey in the Pacific Northwest has gathered acreage data on the ownership of forest land in the region, but no information concerning the identity and type of private forest owners has been obtained. Hence this new technique was designed to obtain a breakdown of private ownership acreage figures by class of owner for the Lane County study, and to develop and test a technique that could be used elsewhere in the Pacific Northwest.

This was done by (1) identifying private forest-land owners by name, (2) classifying them according to whether they were industrial, farm, or nonfarm owners,[4] and (3) estimating the extent of forest ownership by stand-size classes within each owner class. Accomplishing this within the limitations imposed by available time and funds required some sort of statistical sampling design. Therefore, previous studies (*5*, *6*, *7*, *18*) using either the area or line transect method were analyzed.

It soon became apparent that neither method was suited to the objectives of this study. The universe of the present study was narrowly defined to include only owners of private commercial forest land, whereas the area and line transect methods include in their universes all landowners—public and private, forest and nonforest. For this reason, the analysis of results would have been unduly complicated had either of these methods been used.

[3] F. A. Johnson, chief of the statistical section at the Pacific Northwest Station, helped greatly in developing the technique and in computing results.

[4] For reasons discussed later, farm and nonfarm owners were combined in the final classification.

After careful consideration, a random point-sampling technique was devised; it excluded from the sample all elements foreign to the universe. Use of the procedure in this study required an up-to-date Forest Survey type map of the county and township sheets showing in-place ownership of all public and private land. These two items are the basis for Forest Survey acreage estimates of forest and nonforest land within a county.

The following steps outline the technique in detail:

1. A numbered list of townships in the county was prepared, excluding those that contained no private land. Then three numbers were drawn from a table of random numbers to designate (*a*) a township, (*b*) a section in that township, and (*c*) a "forty" in that section. The center of the "forty" became the sample point for this study.

2. This point was then checked on the ownership sheets to determine whether or not it fell on privately owned land. If not, the point was discarded and another drawn.

3. Points that fell on private land were next checked against the type map and accepted as valid samples only if they fell on commercial forest land. Steps 2 and 3 were the means by which the sampling procedure was confined to the particular universe being sampled—private commercial forest land.

4. Each point finally accepted in step 3 was spotted in its appropriate position on blank township sheets, numbered consecutively, and the stand-size class recorded as obtained from the type map.

5. Next the State Forester's office and national-forest district offices were visited to obtain owners' names for all points recorded on the sheets in step 4. The State Forester's office also provided a list showing names and forest acreages owned by members of the two fire protection associations in the county.[5] This list became the basis for classifying industrial owners [6] by size according

[5] These associations are voluntary protective organizations formed by forest-land owners, and most of the larger landowners are members. All other forest-land owners obtain protection under the State Forester's office.

[6] An industrial owner is defined as one who operates a timber-processing plant within the county, such as a sawmill, green veneer or plywood plant, pulp mill, or shingle mill.

to amount of forest land owned. The standard classification of small (less than 5,000 acres), medium (5,000 to 49,999 acres), and large (50,000 acres or more) was used. The district wardens of the two fire protection associations in Lane County and the Industrial Forestry Association also assisted in classifying industrial owners.

6. Lastly, the district wardens and the county forester classified farm and nonfarm owners.

These six steps completed the task of selecting, identifying, and classifying private owners of commercial forest land.

As this was a new study, there was no basis for estimating sampling error and determining a satisfactory sampling intensity. Therefore, from 400 to 500 points were arbitrarily accepted for reasonable coverage of the county. The following reasoning explains why this arbitrary number was selected: If 500 points were drawn, 60 percent should be industrially owned as about two-thirds of the private commercial forest land in the county was believed to be in this ownership class. Thus, 40 percent, or 200 points, would remain in farm and nonfarm ownership. This latter group promised to be the most difficult to classify and would require time spent in the field checking names with the county forester and district wardens. It was further estimated that perhaps half of these 200 points might not be classified by these men and would thus require on-the-ground checking. Two hundred points was believed to be the maximum the men should be asked to classify, and 100 points was thought to be about the maximum for which time and effort could be spent in field checking.

After drawing a total of 1,237 sample points, 65 percent of these (or 806 points) had to be rejected under steps 2 and 3. The remaining 35 percent (431 points) were thought to be sufficient for the final sample. Of the 431, 64 percent were classified as industrial, 20 percent as farm, and 12 percent as nonfarm—4 percent could not be classified immediately as either farm or nonfarm. This 4 percent (or 17 points) was far less than the preliminary estimate of 100 points that might require additional checking for positive classification. The reasoning governing the choice of the total number of points proved to be accurate with respect to the industrial sector, but greatly overestimated the number of farm and nonfarm owners that could not be readily identified.

At this point it was decided not to distinguish between farm and nonfarm owners because of inherent difficulties in defining precisely these two classes in Lane County. Farmowners would have had to be distinguished on the basis of the Census of Agriculture definition of a farm: a place of 3 acres or more producing agricultural products in 1955, and valued at $150 or more, home gardens excluded. This definition would have produced a distorted picture by including as farmers a great many individuals whose primary income came from off-farm sources. The situation in the county is somewhat unusual because of the concentration of industry in the Eugene-Springfield area and the number of forest industries throughout the county.[7] Many of those living on farms work full time in these plants and mills. Farming actually is a sideline. Classifying these individuals as farmowners would not have given a clear picture, so both farm and nonfarm owners were combined as "nonindustrial" owners.

Computation of Results

Table 1 is the net result of the sampling procedure; it shows the number of points that fell in each ownership—stand-size class.

The next step in the analysis was to convert numbers of points in each class to estimates of acreage. The total acreage in the large industrial class and acreages in each stand-size class (all ownerships) were known. These totals had been obtained independently of this study and were without sampling error. To incorporate this information in the analysis, data in table 1 were poststratified as follows:

1. Large industrial (all stand-size classes).
2. Sawtimber (all ownerships except large industrial).
3. Poletimber (all ownerships except large industrial).
4. Seedlings and saplings (all ownerships except large industrial).
5. Nonstocked (all ownerships except large industrial).

This poststratification permitted the calculation

[7] In 1955, more than 200 establishments in the county were classed as forest industries alone—sawmills, veneer and plywood plants, planing and remanufacturing plants, cut-up plants, a pulp and paper mill, shingle mills, and pole yards—with an average monthly employment of approximately 11,000.

TABLE 1.—*Classification of sample points by ownership and stand-size classes*

Ownership class	Stand-size class				
	Saw-timber	Pole-timber	Seedlings and saplings	Non-stocked	Total
Industrial:	*Number*	*Number*	*Number*	*Number*	*Number*
Large	85	18	37	8	148
Medium	53	6	38	2	99
Small	8	8	10	3	29
Total	146	32	85	13	276
Nonindustrial	61	46	46	2	155
All ownerships	207	78	131	15	431

TABLE 2.—*Results of statistical calculations for stratum 1 (large industrial—all stand-size classes)*

Stand-size class	Sample points	Estimated proportion of total area or (P)	Standard error of proportion or (S_p)	Estimated area or (A)[1]	Standard error of estimated area or (S_A)[1 2]
(1)	(2)	(3)	(4)	(5)	(6)
	Number			*Thousand acres*	*Thousand acres*
Sawtimber	85	0. 5743	0. 0406	186. 8	13. 2
Poletimber	18	. 1216	. 0269	39. 5	8. 7
Seedlings and saplings	37	. 2500	. 0356	81. 3	11. 6
Nonstocked	8	. 0541	. 0186	17. 6	6. 0
Total	148	1. 0000	----------	325. 2	----------

[1] Rounded to the nearest 100 acres.

[2] S_A is obtained by multiplying the total acreage in the stratum (325,200 acres for stratum 1) by the respective standard errors of proportions given in col. 4, or $S_A = 325{,}200\ (S_p)$.

of acreage estimates within each class, which when summed equaled the known total acreage for each class.

Table 2 shows the results of statistical calculations for stratum 1 and serves to illustrate how data from table 1 were converted first to estimated proportions of total area and thence into estimates of area. Standard errors of estimated proportions and of estimated areas are also shown. Column 3 shows the proportion that number of sample points in each stand-size class (col. 2) bears to the total of 148 points for the stratum, and these proportions provide unbiased estimates of corresponding true proportions. Standard errors of proportions (col. 4) were calculated by the formula

$$S_p = \sqrt{\frac{P(1-P)}{n}},$$

where P is the proportion and n is the sample size or in this instance, 148.

Estimated areas (col. 5) were obtained by multiplying the known total of 325,200 acres by the respective proportions in column 3. Standard errors of these areas (col. 6) were obtained by multiplying the total acreage in the stratum (325,200 acres) by the respective standard errors of proportions (col. 4).

The calculations for strata 2, 3, 4, and 5 differ somewhat from those for stratum 1 but are basically the same. Table 3 shows the results for stratum 2.

Estimating areas by stand-size class for stratum 1 (table 2) results in indirect estimates of area by

TABLE 3.—*Results of statistical calculations for stratum 2 (sawtimber—all ownerships except large industrial)*

Ownership class	Sample points	Estimated proportion of total area or (P)	Standard error of proportion or (S_p)	Estimated area or (A) [1]	Standard error of estimated area or (S_A) [1 2]
(1)	(2)	(3)	(4)	(5)	(6)
Industrial:	*Number*			*Thousand acres*	*Thousand acres*
Medium	53	0.4344	0.0449	105.1	12.3
Small	8	.0656	.0224	15.9	5.5
Nonindustrial	61	.5000	.0453	121.0	12.8
Total	122	1.0000	----------	242.0	----------

[1] Rounded to the nearest 100 acres.
[2] S_A is the product of 2 factors, both of which have sampling error. The formula used in computing it is explained in the text.

TABLE 4.—*Estimated areas, with corresponding standard errors, by ownership and stand-size classes* [1]

Ownership class	Stand-size class								Total	
	Sawtimber		Poletimber		Seedlings and saplings		Nonstocked			
	Estimated acreage	Standard error	Estimated acreage	Standard error	Estimated acreage	Standard error	Estimated acreage	Standard error	Acreage	Standard error
Industrial:	*thousand acres*		*thousand acres*		*thousand acres*		*thousand acres*		*thousand acres*	
Large	186.8	13.2	39.5	8.7	81.3	11.6	17.6	6.0	325.2	[2] 0
Medium	105.1	12.3	13.4	5.3	71.3	10.1	7.2	4.7	197.0	17.4
Small	15.9	5.5	17.9	6.0	18.7	5.7	10.9	5.4	63.4	11.3
Total	307.8	18.9	70.8	11.8	171.3	16.4	35.7	9.4	585.6	29.2
Nonindustrial	121.0	12.8	102.8	9.9	86.3	10.7	7.2	4.7	317.3	20.0
Total	428.8	[2] 0	173.6	[2] 0	257.6	[2] 0	42.9	[2] 0	902.9	[2] 0

[1] Rounded to nearest 100 acres.
[2] Zero indicates that corresponding total acreages were known exactly and are thus without sampling error.

stand-size class for each of the other strata. For example, an estimated 186,800 acres in large industrial sawtimber (table 2) gives an estimated 242,000 acres in stratum 2 (table 3) because total sawtimber area is known without sampling error (from an independent source) to be 428,800 acres. In table 3, the standard errors of proportions (col. 4) and estimated areas (col. 5) are obtained in the same way as for table 2. But the standard errors of these estimated areas (col. 6), unlike stratum 1, are the products of two factors, both of which have sampling error. Thus these standard errors are obtained from the formula,

$$S_A=\sqrt{A^2S_p^2+P^2S_A^2}.$$

in which

S_A=standard error of estimated area.
A=total area in stratum.
S_A=standard error of stratum area.
P=estimated proportion of area.
S_p=standard error of estimated proportion.

Here S_A^2, the squared standard error for the stratum 2 area of 242,000 acres, is the same as the standard error for large industrial sawtimber (13,200, table 2). This is because the two sawtimber areas constitute a whole, and logic indicates

that the standard error of one part must be the same as that for the other part.

Estimated areas and standard errors for the remaining strata were developed in a similar way. Final results of all calculations are summarized in table 4. Note that standard errors for the border totals in each stratum are zero, because these totals are the ones known exactly and thus were without sampling error.

Discussion

The technique outlined in this paper may appear to be of limited usefulness, depending as it does on a forest-type map and township sheets that distinguish between public and private ownership. But these two "crutches" were required only because of the nature of the universe sampled. Had the universe been different—all landowners in the county instead of just private forest owners, for instance—any large-scale map of the county showing townships and sections would have been sufficient. Under these conditions, of course, the universe would be the same as that sampled by either the area or line transect methods mentioned earlier. Thus, before adopting any one of these three methods, someone working in this field might want to consider their relative merits to see which one best meets his needs.

The poststratification used in the calculation of estimated areas and standard errors was dictated not by the nature of the sampling design but by the data—certain border totals were known. Had this not been the case, there would have been no basis for poststratification, but this would not have precluded estimates of areas and their standard errors. The only difference would have been that the border totals would then have depended on estimated areas and thus would have contained sampling error.

An advantageous feature of this technique is that if the total number of valid sample points originally drawn was for any reason found to be inadequate, the sample could have been "sweetened" merely by drawing additional points. This would not have entailed loss of time or effort already spent.

An analysis of time spent on this study shows that a total of 119 man-hours were required for the three operations of drawing points, identifying and classifying owners, and compiling results. Drawing points took 50 percent of this total, identification and classification took 20 percent, and compilation took the remaining 30 percent. Drawing points may appear to have required an unduly large proportion of total time, but this is offset by the fact that, once drawn, each of the 431 sample points was known to be valid. None was discarded later for not belonging to the universe.

Identifying and classifying industrial owners alone took 85 percent of the time spent on this one operation, whereas nonindustrial owners required only 15 percent.

One other feature of this technique was the proportion of time spent in the office compared with that in the field. Of the three operations referred to above, the first and last were carried out in the office, as was most of the time spent on the second operation in identifying and classifying owners. Less than 3 percent of the total time of 119 hours was spent in the field. This did not include travel time, which required less than 2 days.

No attempt was made in the study to determine owner characteristics other than to classify owners by type. Such things as age of owner, length of tenure, how land was acquired, why it was acquired, and educational background—all of which have been noted in other landownership studies—were not a part of the present study; nor was any attempt made to relate these characteristics to forest-mangement practices. Had additional time and funds been available, such information would have been obtained, and there is no reason why this could not have been done as a part of this technique. The effect of doing so would have been to increase materially the amount of time spent in the field.

Summary

1. Despite wide interest in forest-land ownership, past studies of the pattern of such ownership have shown little variation in objectives and procedures.

2. Objectives of these studies fall into three groups: (*a*) Concern only with identity and characteristics of forest owners; (*b*) relation of such knowledge to extent and quality of management practices of owners; and (*c*) use of both types of

data to provide a sound basis for development of land-management policies and programs in an area.

3. Concerning procedures, two groups of studies can be recognized: (*a*) An intensive type, which depends on a 100-percent canvass of all owners in a specified area and does not employ statistical sampling designs, and (*b*) an extensive survey using statistical sampling designs, with sample results expanded to an entire universe.

4. In extensive surveys, only two types of sampling design have been used so far as can be determined: (*a*) An area design that takes small blocks of land (in relation to total area covered) as the sampling unit, and (*b*) a line transect design that uses equally spaced lines running entirely across the area concerned. A new technique, reported in this paper, has been developed; it offers another means of conducting extensive surveys of landownership. It is based on a random point-sampling design.

5. A major argument in favor of this new technique is that it sampled only the particular universe concerned—private commercial forest land. This procedure precluded the possibility of obtaining elements such as public ownerships and all nonforest land, which were foreign to the given universe.

6. This technique is applicable only when detailed maps are available to define the universe being sampled. In this instance, had there not been a forest type map of the county and township sheets showing inplace ownership of public versus private land, the technique would not have worked. These two items were needed to define the universe for this study. A different universe might have required a different map.

7. The nature of the technique is such that additional sample points could have been drawn without loss of time had the original size of sample proved to be inadequate.

8. Officework predominates in use of this technique under conditions of the present study. Less than 3 percent of the total time spent was required for fieldwork, not including traveltime.

9. Owner characteristics and their relation to forest-mangement practices and intentions were not a part of the study, although with additional funds such information could have been obtained.

Literature Cited

(*1*) Baker, H. L., and Poli, A.
1952. AREA AND OWNERSHIP OF FOREST LAND IN HUMBOLDT COUNTY, CALIFORNIA. U.S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Survey Release 16, 23 pp., illus. (Processed.)

(*2*) Barraclough, S. L., and Rettie, J. C.
1950. THE OWNERSHIP OF SMALL PRIVATE FOREST-LAND HOLDINGS IN 23 NEW ENGLAND TOWNS. U.S. Forest Serv. Northeast. Forest Expt. Sta. Paper 34, 32 pp., illus. (Processed.)

(*3*) Chamberlin, H. H., Sample, L. A., and Hayer, R. W.
1945. PRIVATE FOREST-LAND OWNERSHIP AND MANAGEMENT IN THE LOBLOLLY-SHORTLEAF TYPE IN SOUTHERN ARKANSAS, NORTHERN LOUISIANA, AND CENTRAL MISSISSIPPI. La. Agr. Expt. Sta. Bull. 393, 46 pp., illus.

(*4*) Folweiler, A. D., and Vaux, H. J.
1944. PRIVATE FOREST-LAND OWNERSHIP AND MANAGEMENT IN THE LOBLOLLY-SHORTLEAF TYPE OF LOUISIANA. Jour. Forestry 42: 783–790.

(*5*) Hasel, A. A., and Poli, A.
1949. A NEW APPROACH TO FOREST-OWNERSHIP SURVEYS. Land Econ. 25(1): 1–10, illus.

(*6*) James, L. M.
1950. DETERMINING FOREST-LAND OWNERSHIP AND ITS RELATION TO TIMBER MANAGEMENT. Jour. Forestry 48: 257–260.

(*7*) Hoffman, W. P., and Payne, M. A.
1951. PRIVATE FOREST-LAND OWNERSHIP AND MANAGEMENT IN CENTRAL MISSISSIPPI. Miss. Agr. Expt. Sta. Tech. Bull. 33, 38 pp.

(*8*) Poli, A.
1952. CONDUCTING A SURVEY OF OWNERSHIP OF FOREST LAND IN CALIFORNIA. Agr. Econ. Res. 4: 8–12.

(*9*) Poli, A.
1956. OWNERSHIP AND USE OF FOREST LAND IN NORTHWESTERN CALIFORNIA. Land Econ. 32: 145–151.
(*10*) ———, and Baker, H. L.
1953. OWNERSHIP AND USE OF FOREST LAND IN THE COAST RANGE PINE SUBREGION OF CALIFORNIA. U.S. Forest Serv. Calif. Forest and Range Expt. Sta. Tech. Paper 2, 64 pp., illus. (Processed.)
(*11*) ———, and Baker, H. L.
1954. OWNERSHIP AND USE OF FOREST LAND IN THE REDWOOD—DOUGLAS-FIR SUBREGION OF CALIFORNIA. U.S. Forest Serv. Calif. Forest and Range Expt. Sta. Tech. Paper 7, 76 pp., illus. (Processed.)
(*12*) ———, and Griffith, D. T.
1948. FOREST LAND OWNERSHIP IN NORTHERN MENDOCINO COUNTY, CALIFORNIA. U.S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Survey Release 5, 49 pp., illus. (Processed.)
(*13*) Southern, J. H., and Miller, R. L.
1956. OWNERSHIP OF LAND IN THE COMMERCIAL TIMBER AREA OF NORTHEAST TEXAS. Texas Agr. Expt. Sta. Prog. Rpt. 1903, 7 pp.
(*14*) ———, and Miller, R. L.
1956. OWNERSHIP OF LAND IN THE COMMERCIAL TIMBER AREA OF SOUTHEAST TEXAS, 1955. Texas Agr. Expt. Sta. Prog. Rpt. 1853, 6 pp.
(*15*) Stoddard, C. H., Jr.
1942. FUTURE OF PRIVATE LAND OWNERSHIP IN THE NORTHERN LAKE STATES. Jour. Land and Pub. Util. Econ. 18(3): 267–283.
(*16*) Tennessee Valley Authority.
1956. INFLUENCE OF WOODLAND AND OWNER-CHARACTERISTICS ON FOREST MANAGEMENT; A SURVEY OF 505 CASES IN THE TENNESSEE VALLEY. Report 217–56, 38 pp., illus.
(*17*) U. S. Forest Service
1957. FOREST RESOURCES AND FOREST INDUSTRIES OF LANE COUNTY, OREG. Pacific Northwest Forest and Range Expt. Sta. Forest Survey Report 131, 117 pp., illus. (Processed.)
(*18*) ———
1956. SMALL FOREST LANDOWNERSHIPS, OREGON AND WASHINGTON. Div. State and Private Forestry, Region 6, Portland, Oreg. 26 pp., illus. (Processed.)
(*19*) White, H. G.
1950. FOREST OWNERSHIP RESEARCH IN HISTORICAL PERSPECTIVE. Jour. Forestry 48: 261–264.
(*20*) Yoho, J. G., James, L. M., and Quinney, D. N.
1957. PRIVATE FOREST LANDOWNERSHIP AND MANAGEMENT IN THE NORTHERN HALF OF MICHIGAN'S LOWER PENINSULA. Mich. Agr. Expt. Sta. Tech. Bul. 267, 56 pp.

Book Reviews

The Changing Population of the United States. By Conrad Taeuber and Irene Taeuber. John Wiley and Sons, New York. 1958. 357 pages. $6.50.

TO THE 1950 U.S. CENSUS monograph program goes the credit for initiating the clearest and most readable account yet presented of the growth and changing characteristics of the American people. The book, which could not have been entrusted to more competent hands than this husband and wife team, has an admirable brevity. It is one of the few in which I would join Oliver Twist in asking for more. It is safe to predict that it will prove to be the most popular and most quoted of all the present monographs. Students, laymen, and professors will find this the place to begin searching out our continuing population trends. Only the professional demographer, however, will fully appreciate the clarity and the finesse with which the authors have woven together the strands of their exposition.

Compared with the two Rossiter monographs (1909, 1922) and the Trends Report by Thompson and Whelpton (1934) this study is, as the authors say, "more modest than its predecessors." Previous monographs featured unpublished and retabulated census data, along with new applications in method. The Taeubers, on the other hand, "present broad outlines rather than exhaustive analyses," make excellent use of charts and graphs (75) and clear-cut tabulations (over 100). In addition, there is widespread cross-reference to other studies including the present monograph series. Obviously, the authors have chosen wisely for the overall view.

The need that the authors sense for full treatment of topics and their interrelations in social demography place a real burden on the book's length and its organization. Space limitations do not permit citation of findings, but the topics especially well treated include age and rate of marriage, household and marital status, education, income and migration, both to and within this country. Rural-urban shift and the growth of metropolitan areas also stand out. Early developments are more quickly summarized while special attention is given to changes from 1940 to 1950. Shifts in demographic categories—the attempt in the Census to maintain continuity while doing justice to new conditions—are given bland treatment—not critically presented.

The highest level of interpretation in the book is reached in the conclusion—a stimulating chapter on interrelations in development which brings the multivariate analyses home to fertility, mortality, and population growth. The last chapter on prospects relates recent trends and projections to the future changes that face the American population.

Sometime, somewhere, demographers will have to subject the almost limitless descriptive data of national monographs to manageable generalizations. This is the role of theory, good theory; and it is difficult to do. We shall do this not just for theory's sake; but for comprehension and meaning. Without attempting to dictate to the authors a goal that was no part of their purpose, I would suggest two places in which this might be attempted. First, we may ask whether the complex of declining mortality, declining fertility, and declining immigration can be presented against the framework of the *Demographic Transition* in the United States? Obviously, this gives a certain fit, but it would tend to highlight the baby boom as initiating a new cycle in American population growth. This involves risk, but is the risk any greater than that involved in what we once regarded as purely technical analysis of population projections?

Second, trends in changing population characteristics appear to be almost unmanageable until they are tested against a hypothesis of the convergence in American life of differentials—social and economic. One need not assume closure in such a theory, but it does highlight the one area of divergence—the increasing difference in length of life that women hold over American men. Here the Taeubers score admirably. Convergence is listed in the index and is treated at length. But until someone sets up an acceptable statement of convergence in population characteristics, none of us can criticize an official monograph for due scientific caution.

In conclusion, this reviewer may be permitted a little scientific patriotism. The excellence of this volume pays tribute to (1) an organization which with changes dates back to 1790, to (2) continuing official reports extending a century and a half, and (3) to a most able corps of scientists in the public bureaucracy. If this be demographic chauvinism, let us make the most of it, for the Taeubers represent a goodly heritage.

Rupert B. Vance

The Agricultural Register (New Series): Changes in the Economic Pattern 1956–57. Agricultural Economics Research Institute, University of Oxford. The Sidney Press Limited, Bedford, England. 234 pages. 21s.

STUDENTS OF BRITISH AGRICULTURE will welcome the appearance of the first postwar issue of the *Agricutural Register.* Like its prewar predecessors, it represents a remarkable job of compiling and compressing into one handy reference volume a mass of widely scattered material bearing on current British agricultural and trade policies. No attempt is made at appraisal. As the preface points out, the object is to set out the facts for the use of those concerned with either the field of action or the field of education.

The facts set out relate generally to the years 1954–57. By the middle of 1954, the Government had returned to private hands the trade in most farm products and had shifted from a fixed-price system to deficiency payments, or some other type of direct subsidy system, to implement most of the price guarantees given agriculture under the Agriculture Act, 1947. In line with Government aims, farm output had been greatly expanded—from 128 percent of prewar in 1947–48 to 155 percent in 1953–54, according to official estimates.

A brief summary of the Agriculture Act, 1947, and the price review procedure that precedes the annual determination of the agricultural guarantees (prices and production grants) would have helped the reader to follow the opening chapter on the development of agriculture and Government policy. This chapter is in fact almost wholly confined to developments in 1956–57. It deals with the so-called long-term assurances, embodied in the Agriculture Act, 1957, which in essence limits the Government's authority to reduce agricultural guarantees and establishes a new program of farm-improvement grants. It discusses also the 1957 price review, when the Government, having abandoned the conception of a specific production goal the previous year, stressed again the need for a high level of net output and economic production, but revised price guarantees in an effort to promote desired production adjustments—more beef, lamb, and livestock feed, but no more pork or wheat, and less milk and eggs.

The next two chapters, which account for more than half the book, take up one by one the price-guaranteed products. They are a storehouse of information, not only on the often intricate methods devised to meet price guarantees since decontrol, but also on supplies and prices, subsidies, marketing arrangements, and other matters affecting milk, fatstock and meat, poultry and eggs (poultry meat is not subsidized), wool, grains, potatoes, sugar beets, and sugar.

Fruits and vegetables, which do not benefit from price guarantees but are protected by tariffs and quantitative import controls, receive attention in the chapter following. Tariffs and trade controls including some trade agreements are treated also in the chapter on imports, as are antidumping measures and the European Common Market and proposed Free Trade Area.

Topics in the remaining part of the book come under the headings of labor, land and capital, and inputs. Here may be found information on employment, minimum wages, and safety regulations; land prices and rents, Government-owned or managed land, and surveys of "problem" areas; farm credit and production grants or subsidies not elsewhere described; fertilizers, measures to facilitate the use of homegrown feeding barley, farm machinery, and electricity on farms.

Also included, rather surprisingly, in the section on production grants, is a summary table showing item by item the Exchequer cost of all subsidies arising under all guarantees, both prices and production grants. Although the book does not so state, it can be gathered from the array of facts given that this cost covers most of the cost of agricultural support in Britain, in contrast to other countries where consumers rather than tax-

payers bear the main burden. While tariffs, import controls, monopoly marketing powers, and the like influence wholesale prices of certain products, the British system of price support as a whole involves relatively little interference with market prices.

The details of such a system in operation should be of wide case history interest, making the interest in this book correspondingly wide. It is to be hoped that there will be succeeding issues of the *Agricultural Register* to carry the story forward.

Lois Bacon

American Cooperation 1958. The American Institute of Cooperation, Washington, D.C. 755 pages. 1958. A collection of papers presented at the 30th annual session of the A.I.C. in August 1958 at Pennsylvania State University.

THE CONTENTS of this volume are of interest to everyone concerned with the role of cooperatives in dealing with the farm problem.

> ". . . No business group started out with any more definite and high-level philosophy than the cooperatives did 25 to 30 years ago. However, many cooperatives seem to have adopted the day-by-day operational vocabulary to the point of where they are not very vocal about their viewpoints and their philosophies today. This seems to be occurring in cooperatives at the very time when private profit businesses are becoming more vocal in regard to their philosophic, ethical and social viewpoints."

The above statement by Thomas H. Nelson reflects a concern over "viewpoint" which is treated in a variety of ways throughout the volume—all the way from the extreme idealism of youthful contestants in 4–H Club contests to the more mature judgments of such cooperative leaders as Ezra Taft Benson and Gale C. Anderson.

Secretary Benson's concern with viewpoint involves the relation of farm cooperatives to government when he says:

> "I have little patience with those who complain because Congress has at times given special recognition to farmer cooperatives—who contend that farmer cooperatives are socialistic—or who argue that cooperatives do not pay their fair share of taxes. In this country every citizen is free to select the form of business organization of his choice. He can be an individual proprietor; he can be a partner; he can form a conventional business corporation; or he can organize a cooperative association."

Mr. Anderson's concern over viewpoint reveals a fear of too much government action when he says:

> ". . . we can lose our freedoms and our liberties, our democratic institutions and our democratic economics of Capitalism, if we are not alert to what is going on in this country and stop this trend of turning to the government to solve all of our problems."

Concern over viewpoint extends to such excellent success stories as the one by A. J. Jessee describing his experience with the Shen-Valley Meat Packers, but here it is a concern lest people be led to expect too much. He says:

> ". . . the association for the past two years has been able to return to producers from earnings a Patronage Allocation of approximately one-half cent per pound of livestock that they marketed through the cooperative."

These four samples among many that might be cited are sufficient to suggest that an adequate viewpoint regarding the role of cooperatives in dealing with the farm problem is something much more profound than the notion that through cooperation farmers are enabled to buy and sell more advantageously. Such a general conception could include political cooperation; and if so, could as easily result in either more or less use of the power of government.

Current developments in vertical and horizontal integration attracted a great deal of attention of those attending this meeting. Can cooperatives, in the face of these developments do as Secretary Benson suggests they can, "maintain control for farming?" Has D. W. Brooks pointed up the current issue when he says cooperatives are "going to join the quick or the dead?" Does Mueller's exposition of what is happening to dairy cooperatives mean that control of farming will gradually slip further into the hands of corporations?

And what do cooperative leaders really mean when they say farmers should have more bargaining power? Do they mean that the only

additional bargaining power farmers should have is that which comes from banding together voluntarily in sufficiently large groups to enable them to buy at wholesale rather than retail, and to obtain the savings of efficient merchandising? This is clearly one conception of the proper role of cooperatives, and it includes little or no control over supply to provide "market power." Is it a proper function of government to supplement the persuasive power of cooperative leaders with the governmental power of marketing orders? Is the only test of the applicability of such power to a specialty product rather than a "basic" crop the question of whether it can be made to "work"? These are some of the questions the reading of this volume raises in the mind of this reviewer. They are in my opinion some of the key unresolved issues in the public mind and in the minds of cooperative leaders.

It is a hallmark of our culture that issues such as these are being discussed by such a broadly based and democratic group as that assembled by the A.I.C. However difficult our problems may be, the prospect for dealing with them in the general interest is heightened by this exchange of ideas between operating managers, professional research workers, Extension workers, and Government administrators of programs vitally affecting cooperatives.

Bushrod W. Allin

Studies in the Mathematical Theory of Inventory and Production. By Kenneth J. Arrow, Samuel Karlin, and Herbert Scarf. Stanford University Press. Stanford, Calif. 340 pages. 1958. $8.75.

INVENTORY PROBLEMS lie all around us; some are recognized as such, others are not. In remarking on the ubiquity of inventory problems, Arrow, Karlin, and Scarf write:

> "An inventory problem might, for example, involve deciding how much typing paper to stock each month for an office, or how many spare parts to keep on hand for a given machine. When production is involved, the inventory problem might require determining how much wheat to plant per year or how much gasoline of a certain variety to have blended. How much water to release from a dam for electricity and irrigation purposes is an inventory problem; how many workers to hire for a given labor force is another. Inventory problems may involve scheduling, production, determining efficient distribution of commodities in certain markets, finding proper replacement policies for old equipment, determining proper prices for goods produced, or combinations of these elements."

To this list the agricultural economist might add the problem of optimal carryover levels for grains, a subject on which the U.S. Department of Agriculture has recently published a technical bulletin.[1] He might also point out that many problems in the livestock-dairy area are in fact inventory problems, although little has yet been made of this fact.

Much of what is known about inventory theory is of recent vintage. The field of operations research, developed largely since World War II, has as its purpose the solution of concrete problems that arise in business, government, and military activities. As many of these problems are connected with inventories, it is not surprising that the theory has been developed by people in the operations research field, and in a way that is particularly applicable to business problems. *Studies in the Mathematical Theory of Inventory and Production* is directed primarily to the operations research worker, but the agricultural and the general economist can read much of it with profit.

The book consists of a series of interrelated papers that treat the mathematical and conceptual problems involved in business decisions about inventory holdings and production. It is not intended to be a systematic treatise. Despite this, I venture the guess that the first two chapters will be widely read as an introduction to the growing literature on inventories and production. In these chapters, the authors discuss the relation of current developments to earlier work by economists on inventories and present a unified and detailed picture of the structure of inventory problems. Common

[1] Gustafson, Robert L. CARRYOVER LEVELS FOR GRAINS. U.S. Dept. Agr., Agr. Mktg. Serv. Tech. Bull. 1178. 1958.

elements in problems of a seemingly diverse nature are uncovered, and the stage is set for the more technical papers to follow.

In chapters 4 to 7, the authors are concerned with production over time, both with and without storage. Given the costs of producing any output, of storing output, and of changing the level of output, the firm's problem is assumed to be the minimization of costs, in some relevant sense, over a period of time. The demand for the firm's product is treated as a known function of time, and it is assumed that the firm must meet all demands exactly. This special assumption is of greater relevance to the industrial than to the agricultural sector, but the tools that the authors forge are of a wide range of applicability and could be adapted to the purposes of those of us who are interested in agriculture.

Chapters 8 to 13 deal with optimal inventory policies when future demands are uncertain. Here more complex models are considered than have been analyzed by previous workers. They are largely extensions of the Arrow-Harris-Marschak inventory model, which is the root of most current work on inventories, including that of Gustafson on optimal grain storage policy. In two of these chapters, the authors are concerned with applications of inventory theory to problems involved in hydroelectric operations and in stocking machine-repair parts.

Chapters 14 to 17 deal primarily with the development of new mathematical tools for handling the kinds of problems that arise when inventories are discussed. Several contributions to the theory of stochastic processes are made. Many inventory problems are so complex that solutions to them that can actually be computed are difficult to obtain. The material in these chapters lends itself particularly to comparison of alternative inventory policies as opposed to the computation of a single optimal policy. This is extremely useful from a practical standpoint, as, in actual situations, we are frequently restricted to a limited number of policies for institutional reasons.

Farm management experts and those interested in commodity storage policies will, of course, find much that is useful in *Studies in the Mathematical Theory of Inventory and Production;* also economists who are interested in the supply of agricultural commodities will derive indirect benefit. Many cyclic phenomena in agriculture, such as the so-called cattle cycle, have never been explained satisfactorily. Inventory decisions by producers lie at the heart of many of these phenomena, and it may be that more sophisticated inventory models will provide better explanations than we have had so far. This book provides a basis for developing such models.

Though the volume does not provide an index, it contains a chapter that summarizes all the other papers in detail. It is a challenging but difficult book. Mathematical sophistication and background of a high order are required to read it through, but the rewards are great.

Marc Nerlove

Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges [1]

ANDERSON, K. E. MILK CONSUMPTION IN THE NATION'S SCHOOLS. U.S. DEPT. AGR. MKTG. RES. RPT. 284, 29 PP. NOV. 1958.

This study discloses the extent of milk services in the public schools. Daily consumption of milk per pupil averaged 0.7 half-pint in schools participating in the Special Milk Program during the survey period, 40 percent more than the average of 0.5 half-pint in other schools serving milk. During the month of the survey, children in public elementary and secondary schools purchased 409 million half-pints of milk. This report shows the consumption of milk in schools by type of lunch service, regions, population density, size of school in terms of enrollment, and by grade level.

BIERMAN, R. W., AND CASE, B.A. FARM-MORTGAGE LOANS OF THE FEDERAL LAND BANKS. U.S. AGR. RES. SERV. ARS–43–86, 78 PP. DEC. 1958.

This is a description of Federal Land Bank lending from 1950 to 1957, inclusive. At the beginning of 1958, the Federal Land Banks held 18 percent of all farm-mortgage debt outstanding. Interest rates on loans outstanding averaged 4.2 percent, compared with an average rate of 4.8 percent for all farm-mortgage lenders. In 1957, the average size of all farm mortgages recorded by the land banks was $9,050. The major purpose of land bank loans in recent years has been the refinancing of indebtedness, including the refinancing of existing land bank loans.

[1] State publications may be obtained from the issuing agencies of the respective States.

BOWRING, J. R., AND TAYLOR, K. A. TRANSITION TO THE BULK ASSEMBLY OF MILK IN NORTHERN NEW ENGLAND. N.H. AGR. EXPT. STA. BUL. 453, 60 PP., ILLUS. OCT. 1958. (UNDER CONTRACT WITH AGR. MKTG. SERV.)

Describes and discusses the transition of smaller dairy farms from can to tank assembly of milk. Under this system, milk is cooled and stored on the farm in refrigerated bulk tanks, transferred to a tank truck by a power-driven pump, delivered to the dealer, and transferred from tank truck to dealer's tank for processing. Under bulk assembly the point of sale is at the farm. Reaction of producers, dealers, and truckers to the changeover both in prospect and in operation is provided as a guide to community farm leaders and agricultural extension personnel in the development of educational programs. Special emphasis is given to the potential savings to the industry in transportation and assembly costs.

BRIGHT, IMOGENE. FOOD MARKETING COMPANIES. DIVERSIFICATION AND STRUCTURE. U.S. DEPT. AGR. MKTG. RES. RPT. 291, 28 PP. DEC. 1958.

Shows number of companies engaged in food marketing, number of establishments owned by these companies, and extent that the functions of these establishments are diversified. Companies studied included those processing, assembling, and distributing food products but not transporting them. Only 2 percent of the food marketing companies in the U.S. own more than 1 plant, but these companies account for 43 percent of the employees and 52 percent of the payroll of the industry. Only 0.2 percent of all companies in food marketing owned plants that engaged in activities other than those of the parent companies, but these companies had 30 percent of all employees and 38 percent of total payroll in 1954. About 77 percent of these companies were engaged in 2 different industries, and 23 percent in 3 or more.

CAPEL, G. L., GREENE, R. E. L., AND KUSHMAN, L. J. PACKING COSTS AND GRADING EFFICIENCY IN FLORIDA AND ALABAMA POTATO PACKINGHOUSES. FLA. AGR. EXPT. STA. AGR. ECON. MIMEO RPT. 59–7, 37 PP., DEC. 1958. (IN COOP. WITH AGR. MKTG. SERV.)

A continuation and extension of earlier regional work on factors affecting market quality and the use of mechanical harvesters, report deals with problems in packinghouse management and is specifically aimed at determining: (1) Most efficient methods of performing the various packinghouse operations, (2) most efficient combinations of labor and equipment, (3) efficiency of grading, and (4) levels of costs according to type of container. Data on average costs for the season for each type of container and basic data on grading are supplied. In this study, costs were divided into materials, labor, and other. In all three areas studied, the largest group of costs was materials—chiefly bags.

DAVIS, G. B., AND HUTCHINGS, H. M. COSTS AND EFFICIENCIES IN PEA FREEZING OPERATIONS. PART I: VINING. AGR. EXPT. STA. OREG. STATE COL. MISC. PAPER 66, 14 PP., ILLUS. JAN. 1959. (PROCESSED.) (AGR. MKTG. SERV. COOPERATING.)

Compares the costs of plant and field vining on the basis of (1) distance from fields to freezing plants, (2) scale of operation—output of clean peas per hour, and (3) pea-vine ratio. Cost of vining is a substantial portion of the total cost of operating a pea-freezing plant.

FISHER, D. A., AND KOEPPER, J. M. SURVEY OF FARM LABOR IN MISSISSIPPI. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS–260, 36 PP. [DEC. 1958.]

A survey of Mississippi farms during September 23–29, 1956, showed a total of 211,000 farms, largely small-scale cotton farms. Nearly 60 percent were under 50 acres in size, and over 60 percent reported annual sales of farm products of less than $1,200. An estimated 628,000 persons were working on the farms. In addition to 170,000 operators who worked on their farms, over 41,000 (20 percent of all farmers) did nonfarm work or worked on other farms. About 60 percent of the Mississippi operators reported some off-farm work during 1956. Their farms were the major source of income for 63 percent of the operators in 1956. There were also 258,000 unpaid family workers on the farms—over two-fifths of all persons working on Mississippi farms during the survey week. About a fifth of the operators hired additional farm labor. During the survey week, 200,000 hired workers were reported.

GERLOW, ARTHUR, AND MULLINS, TROY. RESERVOIRS FOR IRRIGATION IN THE GRAND PRAIRIE AREA: AN ECONOMIC APPRAISAL. ARK. AGR. EXPT. STA. BUL. 606, 24 PP. DEC. 1958.

The estimated average investment for land, levee construction, and pumping plants for 20–, 40–, 80–, and 160–acre completely enclosed reservoirs was $7,403, $12,074, $20,711, and $38,249, respectively. Cropland was the biggest single item of cost for reservoirs of all sizes. Data on survey farms indicate that at average levels of efficiency irrigating rice from wells on these farms cost more per acre than irrigating from 80– and 160–acre reservoirs, but less per acre than irrigating from 20– and 40–acre reservoirs. Only minor changes in cultural practices were made as a result of irrigating with surface water instead of water from wells.

HARRIS, E. S. MARKETING MARGINS FOR BUTTER. U.S. DEPT. AGR. MKTG. RES. RPT. 289, 45 PP., ILLUS. NOV. 1958.

Creamery butter, despite a decline in per capita consumption, continues to provide farmers with the largest single outlet for milk for manufacturing purposes. The butterfat from 29 billion pounds of milk was used in making creamery butter in 1957—22.9 percent of the total amount of milk produced in the U.S. The farm value of butterfat used in making butter has fluctuated more widely than the retail price of butter. No pronounced single trend is noted in the marketing margin during the 1919–57 period. Extensive changes have taken place in the marketing of butter over the years. Ten actual shipments were studied to provide greater understanding of the butter marketing process. These studies illustrate the variety of services that the several marketing agencies perform in processing butter and moving it to the consumer.

HENEBERRY, W. H., AND BARLOWE, R. PROPERTY TAX TRENDS AFFECTING MICHIGAN FARMERS. MICH. AGR. EXPT. STA. SPEC. BUL. 421, 28 PP., ILLUS. 1958.

Property tax collections have increased about 10 percent per year in Michigan since 1945. Real estate taxes took 8.0 percent of the average Michigan farmer's net income in 1957, compared with 4.1 percent in 1950 and

2.6 percent in 1945. Property taxes in 1956 represented 7.8 percent of the net income of farm operators in a sample of Michigan farm account cooperators, compared with 4.1 percent in 1950 and 3 percent in 1945. The burden of property taxes on farmers is heaviest in the areas surrounding large cities and on relatively unproductive farmland.

HUGHES, W. F., AND MAGEE, A. C. COSTS AND RETURNS OF IRRIGATED PEANUT PRODUCTION, WEST CROSS TIMBERS, 1953–57. TEXAS AGR. EXPT. STA. BUL. 917, 10 PP., ILLUS. SEPT. 1958.

Five years of experience in the West Cross Timber area of Texas show that wells of low capacity (25 to 120 gallons per minute) can be used profitably in production of irrigated peanuts. From 1953 to 1957, yields of peanuts on irrigated land averaged 34 bushels per acre compared with an average dryland yield of 14 bushels per acre. Irrigation also improved the quality of peanuts. It is estimated that irrigated peanut production for these years gave average annual net returns ranging from 19 to 33 percent on investments in irrigation facilities on the farms surveyed.

HUNTER, J. S., CLEMENT, W. E., AND HAVAS, N. PROMOTION OF LAMB—RESULTS OF A CAMPAIGN IN CLEVELAND, OHIO. U.S. DEPT. AGR. MKTG. RES. RPT. 292, 58 PP., ILLUS. DEC. 1958.

Studies the short-run effects of a lamb promotion campaign. Such brief intensive campaigns appear successful in moving increased quantities of lamb and might also be useful in marketing unusually heavy seasonal supplies. To measure the effectiveness of the advertising campaign, researchers analyzed wholesale data, conducted studies in retail stores, compared retail sales and price data, interviewed consumers, and studied the general merchandising practices of retailers with respect to lamb.

HUTCHINS, WELLS A. THE MONTANA LAW OF WATER RIGHTS. MONT. AGR. EXPT. STA. BUL. 545, 121 PP. AUG. 1958.

Part of the revision of "Selected Problems in the Law of Water Rights in the West," issued in 1942 as Miscellaneous Publication 418, U.S. Department of Agriculture. The completed revision will comprise an overall discussion of water rights law for the 17 Western States.

JENNINGS, R. D. CONSUMPTION OF FEED BY LIVESTOCK, 1909–56. RELATION BETWEEN FEED, LIVESTOCK, AND FOOD AT THE NATIONAL LEVEL. U.S. DEPT. AGR. PROD. RES. RPT. 21, 128 PP., ILLUS. NOV. 1958.

Longtime changes in feed consumption by livestock include an increase in the percentage of all feed units coming from hay and a decrease in those from pasture. The formula feed industry has grown increasingly important, and feed additives now play a significant role. Feed inputs per head of livestock have increased over the years, but since 1910, feed consumed per unit of livestock production, excluding horses and mules, has decreased about 20 percent. In recent years, dairy cattle received 30 percent of all feed units including pasture, beef cattle 33 percent, hogs 17 percent, poultry 11 percent, and horses and mules 4 percent.

KIMBALL, N. D. IRRIGATION DEVELOPMENT IN IDAHO UNDER THE DESERT LAND ACT. IDAHO AGR. EXPT. STA. BUL. 292, 39 PP., ILLUS. DEC. 1958.

Three areas—Hazelton, Howe, and Raft River—were surveyed. At Hazelton, complete development in 1956 of a unit including new buildings averaged $150 an acre, and annual net farm income was estimated at $8,547 from a 150-acre unit and $17,321 from a 270-acre unit. At Howe, the cost per acre of development was only $56.26; net farm-income was estimated at $6,632 from a 300-acre unit operated independently from an old farm. At Raft River, it cost about $75 an acre to develop a farm unit, but entrymen's experiences were so varied that income possibilities could not be estimated realistically.

LINDSTROM, H. R., AND LEVINE, D. B. A CONSUMER APPRAISAL OF IMPORTED WOOL FABRIC IN CLOTHING. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS–300 14 PP. FEB. 1959.

A small-scale exploratory study to determine consumers' evaluations of specific features of both imported and domestic wool fabrics in women's clothing revealed that women in the upper income groups, those with more education, and those whose husbands were in managerial, professional, or sales occupations were more likely to have owned and worn clothes made from imported wool fabrics than other women. Imported wool fabrics scored most heavily in ratings for specific characteristics as durability, warmth, and feel but domestic wool fabrics were considered to cost less. In evaluating the remaining characteristics, respondents were equally divided in their opinions between imported and domestic wool fabrics.

MANION, W. M., AND ANDERSON, C. M. FLAXSEED MARKETING PRACTICES AND COSTS AT COUNTRY ELEVATORS. U.S. DEPT. AGR. MKTG. RES. RPT. 301, 47 PP., ILLUS. FEB. 1959.

The bulk of the flaxseed crop enters the market by way of the country elevators in North Dakota, Minnesota, and South Dakota. This study analyzes and evaluates the flaxseed marketing operation at country elevators by studying the costs and returns under present handling practices at individual elevators compared with those for other grains. The main objective is to determine the relative importance of elevator handling costs, transportation charges, and total margin of return over costs on a per bushel basis.

MATHIS, A. G. PROBLEMS IN INITIATING A REPORT OF PRICES RECEIVED FOR BUTTER BY MIDWESTERN CREAMERIES. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS–292, 22 PP. FEB. 1959.

A study of 38 Iowa creameries shows it is feasible to report average weekly net prices based on a sample of creameries. These prices can be expected to show changes from 1 week to another, within one-half cent of the true change in the average price, in 95 percent of repeated trials. This degree of accuracy is possible because transportation and other charges per pound of butter, paid by individual creameries for shipping butter, usually fall close to the average of these charges paid by all creameries. Also, prices reported for butter sold to receivers at interior points were within the range of prices reported for butter sold to receivers at central markets.

MILLER, W. G., CHRYST, W. E., AND OTTOSON, H. W. RELATIVE EFFICIENCIES OF FARM TENURE CLASSES IN INTRA-FARM RESOURCE ALLOCATION. IOWA AGR. AND HOME ECON. EXPT. STA. RES. BULL. 461, 22 PP., ILLUS. NOV. 1958. (NORTH CENTRAL REG. PUB. 84.)

Reports the results of a pilot study concerned with analysis of relationships between some of the conven-

tional land tenure classes—owner-operators, livestock-share renters and crop-share-cash renters—and the use and productivities of land, labor, and capital services employed in Iowa and northern Illinois in 1954. There was no clear evidence that tenure classes differed in efficiency achieved in resource combinations. The nature of the adjustments needed to approach an optimum combination of resources, however, varies between owners and tenants. Owner-operators should have used less of both land and labor and more capital. Tenants were most efficient in the use of labor services, but they were excessive in capital services and deficient in land.

MITCHELL, J. A. SUPPLEMENT TO COMPARATIVE ECONOMIES OF DIFFERENT TYPES OF COTTONSEED OIL MILLS AND THEIR EFFECTS ON OIL SUPPLIES, PRICES, AND RETURNS TO GROWERS. U.S. DEPT. AGR. SUPP. TO MKTG. RES. RPT. 54, 71, PP., ILLUS. JAN. 1959.

This supplement adjusts the 1949–50 cottonseed oil mill operating costs and product prices to 1955–56 levels. The economies of different types of completely new mills (hydraulic, high-speed screw-press, direct-solvent, and prepress-solvent) are compared in terms of net revenues per ton of seed processed on the basis of 1955–56 operating conditions for typical U.S. mills. The analysis showed that different types of mills were the most profitable at different annual crushes. The conclusions regarding the most profitable mill in this report differ from those based on 1949–50 data.

MOORE, E. J. EXPANDING THE RETAIL MARKET FOR FLORAL PRODUCTS. SOME ECONOMIC ASPECTS. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS–286, 11 PP. JAN. 1959.

Food supermarkets and variety stores provide an opportunity for expanding the market for floral commodities. This report provides information on the marketing services and functions which growers and wholesalers may provide to help expand the market. Home use of cut flowers and potted plants is a potential area for market expansion. The most important problem in establishing a merchandising program for cut flowers is insufficient market demand. Potted plant sales have been steadily increasing since 1955 while sales of cut flowers have declined. Other problems faced by mass market outlets are also discussed.

PHILLIPS, V. B. HIRED TRUCK TRANSPORTATION IN MARKETING LIVESTOCK. U.S. DEPT. AGR. MKTG. RES. RPT. 297, 16 PP., ILLUS. DEC. 1958.

Producers spent about $87 million in 1955 for hired transportation by motortruck for moving livestock from farms and ranches to markets. Over three-quarters of the livestock received at terminal public markets and practically all of the animals received at auction markets are hauled by truck. The report discusses variations in length of haul and "for-hire" motortruck transportation costs by species of livestock, market outlets, and regions. For the most part, this report is a source of data rather than an interpretive statement. The report deals only with the year 1955 and only with services used by livestock producers in transporting their livestock to market by hired trucks.

PODANY, J. C. COSTS OF PACKING MICHIGAN PEACHES IN 1957. U.S. DEPT. AGR. MKTG. RES. RPT. 290, 25 PP. DEC. 1958.

This third report in a series on the costs of preparing peaches for the fresh market presents packing costs for farm and central sheds. It was found that farm sheds made greater use of their existing packing capacity and were able to have lower packing costs than central sheds. The cost data are based on observations made in 5 central sheds and in 20 farm packing sheds. The bushel basket was the principal container used for packing peaches.

POWELL, J. V., AND HANES, J. K. COSTS OF MARKETING APPALACHIAN APPLES. U.S. DEPT. AGR. MKTG. RES. RPT. 300, 24 PP., ILLUS. FEB. 1959.

The Appalachian area is in a period of transition—producers are putting more emphasis on packing apples for fresh markets. This study provides labor requirements and costs of seven of the larger producers marketing apples with methods and types of equipment representative of the area. This information is provided to growers to guide them in changes they are making to raise the efficiency of their entire fresh market operation—from the orchard through the packinghouse.

PRITCHARD, N. T. PRICING EGGS IN CENTRAL MARKETS. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS–287, 11 PP. JAN. 1959.

Discusses ways of establishing prices for eggs in New York, Chicago, St. Louis, and Los Angeles. As the structures of markets change in response to technological developments and other factors, pricing systems also require adjustment. These analyses are to learn what effects these changes may have on prices and the performance of markets. This report highlights three previous reports discussing pricing eggs in these cities.

ROY, E. P., AND THOMAS, W. P., JR. FINANCING PRODUCTION AND MARKETING OF BROILERS IN THE SOUTH. PART II: GROWER PHASE. SOUTHERN COOPERATIVE SERIES BUL. 57, 60 PP., JUNE 1958. (AGR. EXPT. STATIONS OF ALA., ARK., GA., LA., MISS., N.C., S.C., AND PUERTO RICO AND AGR. MKTG. SERV. COOPERATING.)

This is the third report in a series on broiler financing in the South. It is concerned with the extent and methods of financing broiler production by the growers, whose job it is to raise broilers to marketable size. The two previous studies have discussed the dealers and lending agencies.

SOLBERG, E. D. THE WHY AND HOW OF RURAL ZONING. U.S. DEPT. AGR. INFORM. BUL. 196, 58 PP., ILLUS. DEC. 1958.

A discussion of reasons for zoning, what zoning tools are available to a community, and how they can best be used. Many specific examples are given of zoning ordinances to meet specific problems.

TAYLOR, J. C., AND BROWN, R. W. FLUID MILK PLANTS IN THE SOUTHEAST—METHODS, EQUIPMENT, AND LAYOUT. U.S. DEPT. AGR. MKTG. RES. RPT. 232, 77 PP., ILLUS. NOV. 1958. (IN COOP. WITH GA. AGR. EXPT. STA.)

Determines labor and equipment requirements and costs for methods used in performing fluid milk plant operations when the daily volume handled is 6,000 gallons. Application of improved work methods to can receiving operations reduces the cost from $2.90 to $2.68 per 1,000 gallons. When milk is received in bulk the cost is reduced from

$1.36 to $1.21 per 1,000 gallons. Costs per 1,000 gallons are reduced for both types of plant studied by approximately 3.5 percent when the low cost combination of methods is used for handling milk. Cost per 1,000 gallons for handling milk in a type 2 plant with the low cost combination method is about 16 percent less than that for a type 1 plant.

TAYLOR, J. W., AND CLIFTON, R. E. SHRINKAGE AND GRADE OF WHEAT STORED IN COUNTRY ELEVATORS IN KANSAS. U.S. DEPT. AGR., AGR. MKTG. SERV. AMS-291, 14 PP. JAN. 1959. (IN COOP. WITH KANSAS STATE COLLEGE.)

Shrinkage in 21 lots of stored wheat varied from 0.8 bushel to 4.2 bushels for every 1,000 bushels stored. Shrinkage losses increase with every successive elevation. Shrinkage cost data obtained in this study show that with an average cost of one-fourth of a cent per bushel per elevation, a 4-year storage program with two complete rotations of storage stocks annually would cost about 2 cents per bushel for shrinkage losses alone.

UNIVERSITY OF KANSAS BUREAU OF BUSINESS RESEARCH. MARKETING MELLORINE IN SEVEN TRADE AREAS. U.S. DEPT. AGR. MKTG. RES. RPT. 296, 41 PP., ILLUS. DEC. 1958.

Mellorine is a frozen dessert made with fats other than milk fat. One of the principal conclusions from the study is that competition among frozen desserts seems to be secondary to the competition among frozen dessert manufacturers. Since the product is essentially local to the State in which it is made, marketing statistics vary considerably. Sales of mellorine in the seven areas studied are affected by price, promotion, and the marketing strategy of frozen dessert manufacturers in each area. The areas in which studies were made were Dallas-Fort Worth; Tulsa; Little Rock; St. Louis; Portland-Corvallis, Oreg.; Springfield, Ill.; and Charleston, S.C.

U.S. AGRICULTURAL MARKETING SERVICE. CONSUMER PREFERENCES FOR FROZEN PEAS IN RELATION TO STANDARDS FOR GRADES. U.S. DEPT. AGR. MKTG. RES. RPT. 280, 19 PP., ILLUS. NOV. 1958.

Tests proved the three grades of peas were clearly discriminable by inexperienced tasters. Grade A was preferred in flavor, tenderness, and color. Grade B was ranked next, and grade C last. The two most important characteristics influencing favorable ratings for all grades were taste and tenderness. These characteristics were also the basis for the distinctions consumers made between grades; for other characteristics mentioned there was little difference between grades.

U.S. AGRICULTURAL MARKETING SERVICE. TRADING STAMPS AND THEIR IMPACT ON FOOD PRICES. U.S. DEPT. AGR. MKTG. RES. RPT. 295, 48 PP., ILLUS. DEC. 1958.

Food prices in retail stores that issue trading stamps have increased by an average of 0.6 percent more than food prices in stores that do not give stamps. This relative price increase was less than the value of stamps issued to consumers, the difference being absorbed by economies associated with increased volume and by a decline in profit per dollar of sales for stores adding stamps. The cost of trading stamps to retailers, exclusive of handling costs, averaged a little more than 2 percent of each dollar of retail sales for which stamps were issued.

U.S. AGRICULTURAL MARKETING SERVICE. TRENDS IN THE UNITED STATES SUGAR INDUSTRY. PRODUCTION, PROCESSING, MARKETING. U.S. DEPT. AGR. MKTG. RES. RPT. 294, 24 PP., ILLUS. DEC. 1958.

Summarizes the domestic sugar industry and some of the more important changes that took place from 1948 to 1957. During this period, domestic sugar-producing areas, including Puerto Rico and Hawaii, supplied between 51 and 54 percent of the total U.S. sugar requirements. Most of the remainder came from foreign areas, chiefly Cuba and the Philippines. Consumption of sugar in the United States has increased at about the same rate as population during the last 10 years. Raw sugar prices increased about 12 percent during this period. Retail prices for all refined sugar increased about 17 percent. Controls exercised through the administration of the Sugar Act and industry pricing policies have resulted in relatively stable retail prices.

UVACEK, E., AND WILSON, D. L. LIVESTOCK TERMINAL MARKETS IN THE UNITED STATES. U.S. DEPT. AGR. MKTG. RES. RPT. 299, 33 PP., ILLUS. JAN. 1959.

The facilities and services made available at the terminal markets by the stockyard company, commission agents, and livestock dealers, and the various charges or costs associated with each are described.

WILLIAMS, W. F., BOWEN, E. K., AND GENOVESE, F. C. ECONOMIC EFFECTS OF U.S. GRADES FOR BEEF. U.S. DEPT. AGR. MKTG. RES. RPT. 298, 199 PP., ILLUS. JAN. 1959.

This study of packers, wholesale distributors, and retailers of meat on the uses and economic effects of Federal grades and proprietary brands for beef shows that Federal grades have stimulated price competition, held down costs of marketing, contributed to changes in the organization of the wholesale meat industry, tended to increase production and consumption of beef, shifted consumption among the grades, and improved the speed and accuracy with which beef prices are transmitted from consumer to beef producers. The study also points out additional advantages of federally graded beef.

Statistical Compilations

CANNON, M. F. CASH RECEIPTS FROM MAJOR FARM COMMODITIES BY STATES AS PERCENTAGE OF STATE TOTALS, 1924–57. U.S. DEPT. AGR., AGR. MKTG. SERV. STATIS. BUL. 246, 70 PP., ILLUS. MARCH 1959.

Supersedes Statis. Bul. 186 of May 1956.

U.S. AGRICULTURAL RESEARCH SERVICE. A STATISTICAL SUMMARY OF FARM TENURE, 1954. U.S. DEPT. AGR. INFORM. BUL. 200, 62 PP. NOV. 1958.

AGRICULTURAL ECONOMICS RESEARCH

Is published quarterly by the Agricultural Marketing Service, U.S. Department of Agriculture. The printing of this publication has been approved by the Bureau of the Budget, Feb. 8, 1956.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 20 cents a single copy, 75 cents a year, domestic, $1 foreign.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. - Price 20 cents (single copy).
Subscription price: 75 cents a year; 25 cents additional for foreign mailing.